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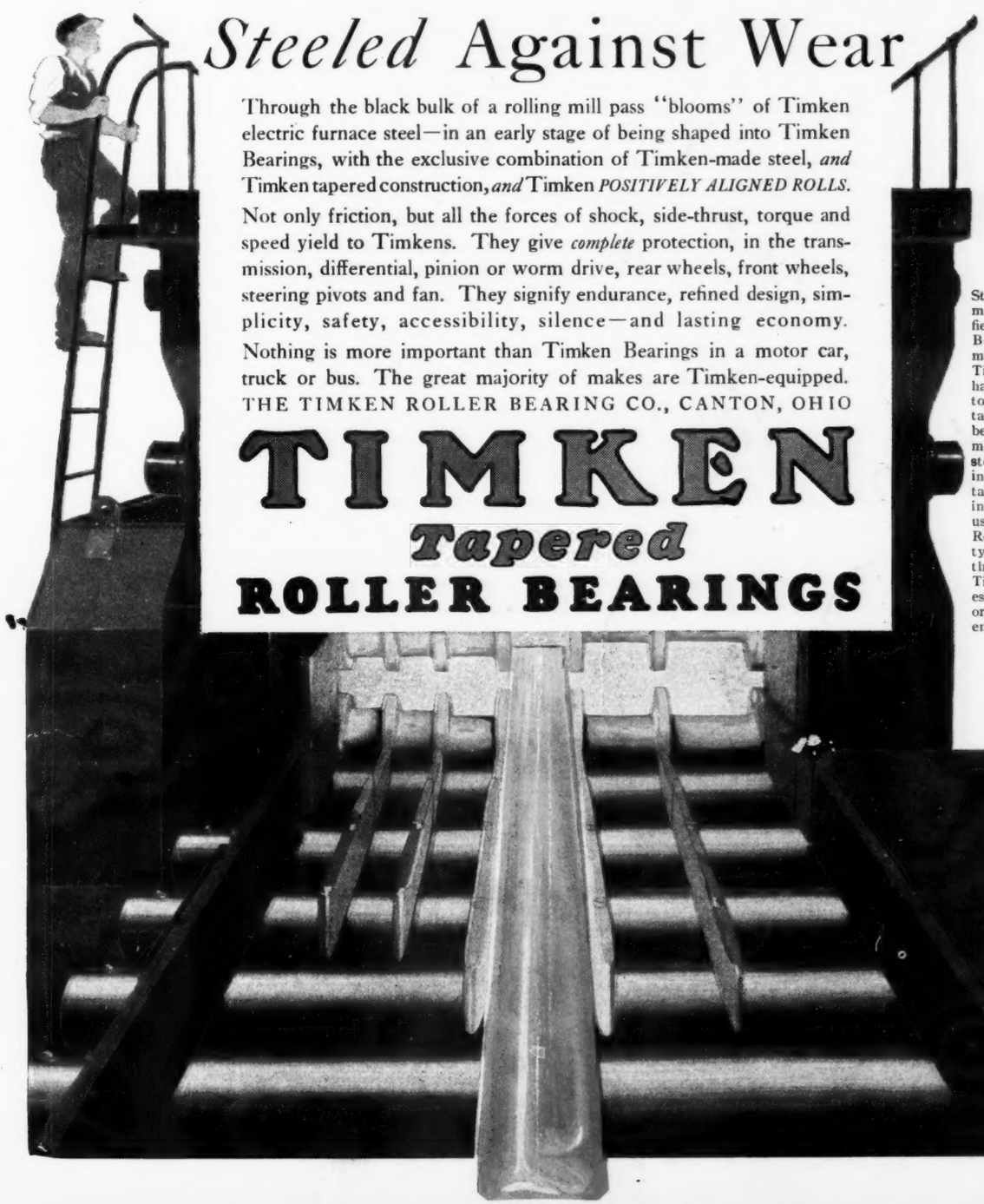

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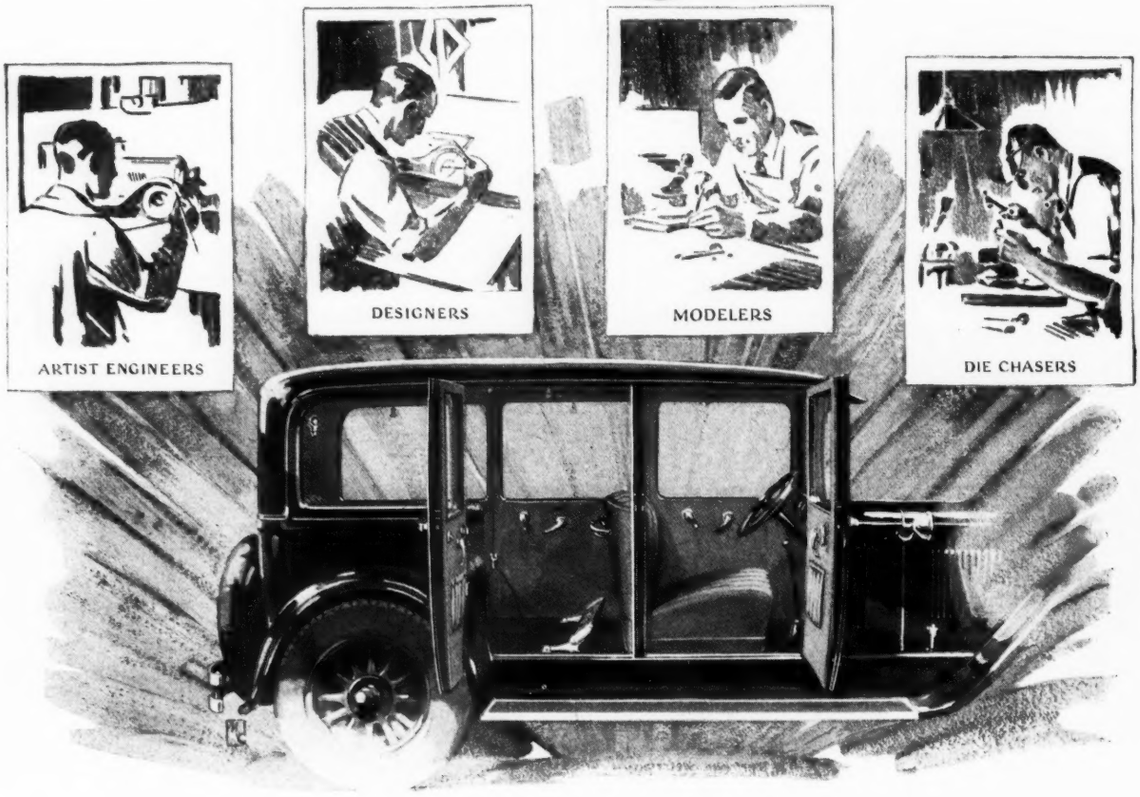

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AUTOMOTIVE INDUSTRIES
VOLUME 57 *Philadelphia, Saturday, October 15, 1927* NUMBER 16

New Cars Show *Gradual Evolution of Design* Taking Place

Higher engine output is one characteristic of models for 1928. Year will be remarkable in automobile history for thorough overhauling in low-price field.

By P. M. Heldt

A CONSTANT though gradual evolution of design practice has come to light since the new car models for the 1927-8 selling season began to make their appearance, although few striking developments have been observable.

Manufacturers are always keen to improve their cars with respect to speed, handling qualities, comfort, safety, reliability, durability and appearance, and at the same time to take advantage of every possibility to reduce costs. New departures are made at intervals by the most progressive firms, and if the new features find favor with the buying public and are of such a nature that there are no legal or commercial restrictions on their use, they finally become the common practice. Most of the changes observable in the new models are of this character.

The demand for greater speed and higher acceleration is evidently still insistent, for many of the redesigned models have increased piston displacement. Examples are the Cadillac, Chrysler 72, Oakland, Franklin and Locomobile Junior Eight. Increase in piston displacement, moreover, is only one of several methods of increasing engine output. Another possibility consists in increasing the compression ratio, and there has been quite a forward movement in this direction. Compression ratios of 5 and over are no longer uncommon, the wide distribution of anti-knock fuels having made such ratios commercially practicable. Chrysler in three of its models now fits the engines of roadsters with special high compression heads and offers these heads as extras for other types. From sources close to the non-detonating fuel industry it is learned that one or two other manufacturers are planning to take similar steps in the near future.

Whether a gain in output has been secured also by increasing engine speed is difficult to say. There certainly have been a few instances of engine speeds being stepped up markedly, but these were cases of firms which had

The Current Trends in Car Design

Engine

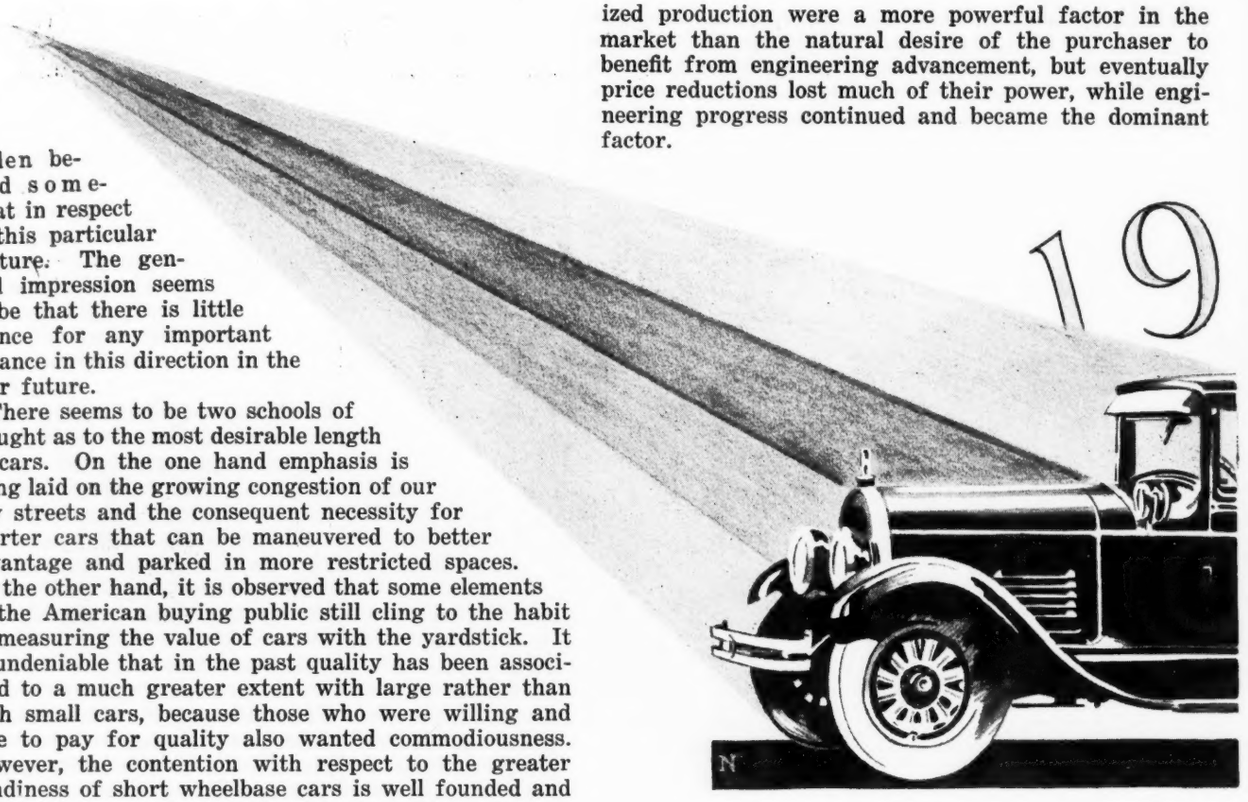
Piston displacements and compression ratios have increased.
Gain has been made by the steel or invar-strut type of aluminum alloy piston.
Practice of making inlet and exhaust valves interchangeable is losing ground.
Crankcase ventilation is becoming general practice.
Use of nickel or nickel and chromium in cylinder castings is growing.
Use of counter-weights on crankshafts is on the increase.
Dual valve springs are becoming popular.
Manifold heat control systems spreading.
Further progress made in adoption of oil, air and fuel cleaners.
Shaft rolled up of sheet steel and welded is innovation in propeller shafts.

Chassis

Wheelbases have been shortened considerable in several cases, although lengthened in one or two others.
Rear tread is being widened to increase width of rear seat.
Some makers have provided for adjustment of steering gear angle.
Adjustability of pedal lengths coming to be more common feature.
Move toward greater reductions in steering gears continues.
Lighter frames with more cross members are in vogue.
Demand for less over-all height is calling for double drop frames.
Four-wheel brakes standard on practically all new cars.
Wheel diameters still show a downward trend.

Body

Radiators are narrower and higher.
Horizontal louvres are gaining favor.
Trend continues toward narrower front corner posts in order to give maximum visibility.
Artistic panel effects still sought in grouping of instruments.
In some of the small cars leg room in front compartment has been increased by forming the dash of pressed steel with outward recesses.
Form-fitting seats are coming into extensive use.
Remote door controls now a common feature on closed models.
Fenders and running boards on the low-priced cars are being substantially improved.



fallen behind somewhat in respect to this particular feature. The general impression seems to be that there is little chance for any important advance in this direction in the near future.

There seems to be two schools of thought as to the most desirable length of cars. On the one hand emphasis is being laid on the growing congestion of our city streets and the consequent necessity for shorter cars that can be maneuvered to better advantage and parked in more restricted spaces. On the other hand, it is observed that some elements of the American buying public still cling to the habit of measuring the value of cars with the yardstick. It is undeniable that in the past quality has been associated to a much greater extent with large rather than with small cars, because those who were willing and able to pay for quality also wanted commodiousness. However, the contention with respect to the greater handiness of short wheelbase cars is well founded and may become a more potent argument as time goes on.

Two of the new six-cylinder cars have a wheelbase of only 107 in. which some engineers believe to be the shortest consistent with comfortable seating accommodations. The most notable instance of a decrease in wheelbase of a redesigned model is that of the Dodge four, which had its wheelbase reduced from 116 to 108 in. There have been also several instances of an increase in wheelbase, notably the Oakland.

Rear Tread is Increased

With the advent of balloon tires it has become impossible in large machines to provide a comfortable rear seat for three and still retain the standard wheelbase of 56½ in. In fact, this has always been difficult with large machines, with their necessarily larger tires and usually deeper upholstery. At one time it looked as though this would lead to the abandonment of five and seven-passenger in favor of four and six-passenger types, but now the problem has been solved by increasing the tread of the rear wheels to 58 or 58½ in. With the rapid improvement of our highways there is no longer the same necessity for sticking to the standard tread that there was a decade ago.

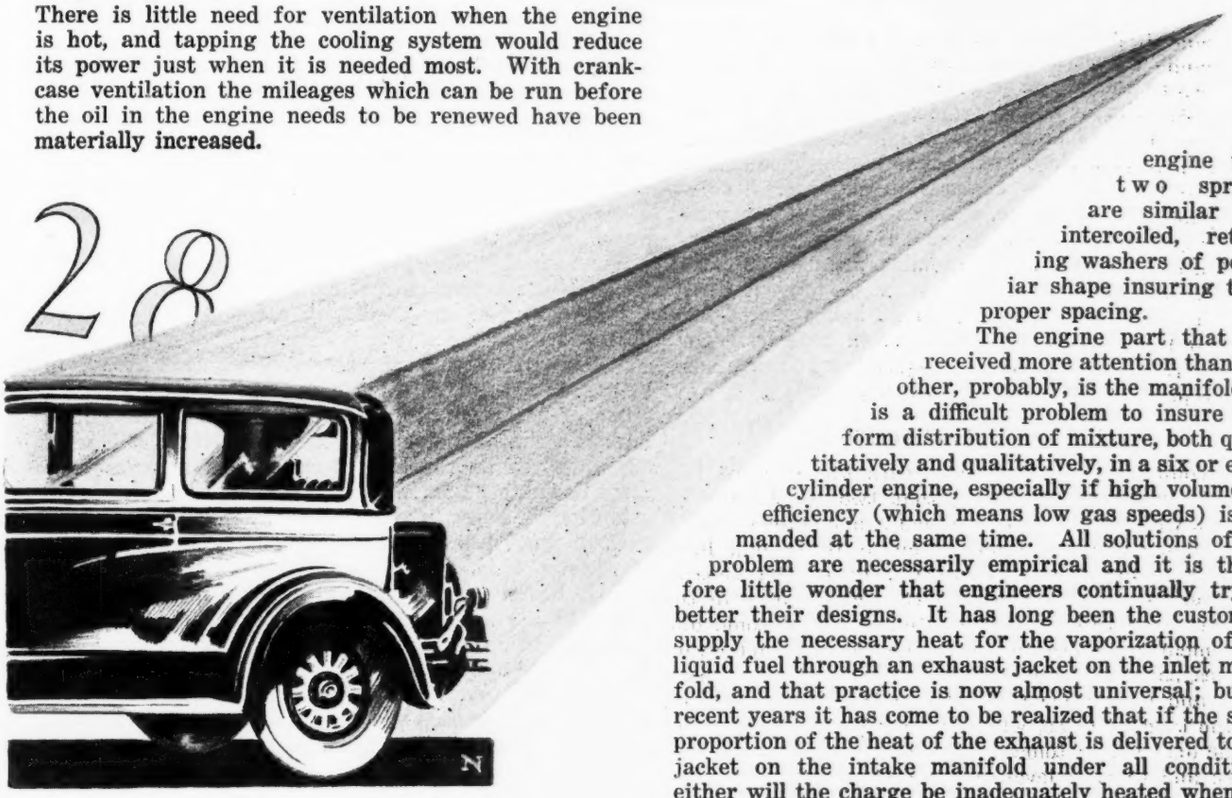
The current year will be remarkable in automobile history in that it witnessed a thorough overhauling of design in the low-priced car field. It has been a patent fact that engineering progress in connection with passenger car design during the past decade has been most marked in the medium-priced field. In the high-priced field the production of most of the makers is comparatively small and it is necessary to continue a model for a good many seasons without important changes in order to properly amortize the cost of development work, tooling, etc. At the other end of the scale the manufacturing equipment used has been so elaborate and costly, and prices of the product have been so low, that radical changes in design naturally were dreaded and were deferred as long as possible. For a long time the economies resulting from standardized production were a more powerful factor in the market than the natural desire of the purchaser to benefit from engineering advancement, but eventually price reductions lost much of their power, while engineering progress continued and became the dominant factor.

There does not seem to be any change in respect to cylinder numbers. The four-cylinder machine continues to hold its field at the lower end of the price scale, while the eight-cylinder vertical engine is most popular with assemblers in the medium price field.

As to engine design, the upward creep of compression pressures has been mentioned already. A great gain has been made by the steel or invar-strut type of aluminum alloy piston. With respect to valves, the old practice of making inlet and exhaust valves interchangeable is no longer followed to any extent. For exhaust valves silicon-chromium steel is widely used, while for the inlets a lower-priced material, such as nickel steel, is generally selected, the advantage of interchangeability not being considered worth the difference in the costs. Since the two valves are not interchangeable by reason of the difference in the materials, there is no object in making them mechanically alike, and they are now often different in form. In the new Cadillac, for instance, the inlet valves have a 30 deg. seat, the object in reducing the seat angle evidently being to secure the advantage of the larger effective opening for the same lift.

Crankcase ventilation is a practice that has gained rapidly during the past year. It will be remembered that in some of the earlier applications of this principle the ventilation was affected by the suction in the inlet manifold, but in the more recent applications the difference in air pressure under the hood and outside the engine space is made use of. The Franklin is in a class by itself in this respect, in that it taps the air supply to the cooling jackets for crankcase ventilation. The pressure head in this case is evidently several times as great as where that produced under the engine hood by the radiator fan is made use of, and this explains the reason for providing means on the Franklin for automatically shutting the ventilator opening when the crankcase oil reaches a certain temperature.

There is little need for ventilation when the engine is hot, and tapping the cooling system would reduce its power just when it is needed most. With crankcase ventilation the mileages which can be run before the oil in the engine needs to be renewed have been materially increased.



The use of nickel or of nickel and chromium in cylinder castings is expanding. These alloying elements are now used by Cadillac, Chrysler, Franklin and others. They have the remarkable property of rendering the cylinder walls harder and more resistant to wear without increasing the machining difficulties.

Counter-weights on Crankshaft

The use of counter-weights on crankshafts is on the increase. Chrysler is now using them on the 72 in addition to the 80, and the new Franklin also has them. Such counter-weights have little to do with engine vibration, but they decrease the loads on the crankshaft main bearings. More engines of the six and eight-cylinder types are being fitted with torsional vibration dampers or neutralizers. Engine bearing numbers tend to increase. That is, most of the new six-cylinder engines have seven bearings and in one case at least the number has been increased from three to four. In some of the higher grade cars the crankpins are drilled out to a considerable diameter, to minimize centrifugal force.

It is now conventional practice to combine the fan and water pump in one unit which is driven by a V-belt, adjustment of belt tension being affected by moving one flange of one of the belt pulleys laterally with respect to the other. By making the vanes of the pump rotor helix-shaped, the end thrust due to the fan can be neutralized. More of the cars in the medium price class are being equipped with both thermostats and radiator thermometers.

Dual valve springs are gaining ground. With high-speed engines there has been considerable trouble from spring breakage due to surge, and it appears that this can be effectively guarded against by doubling the springs. Generally the two springs are of different diameters and made of wire of different sizes, one being placed within the other, but in the new Packard engine the two springs are similar and intercoiled, retaining washers of peculiar shape insuring their proper spacing.

The engine part that has received more attention than any other, probably, is the manifold. It is a difficult problem to insure uniform distribution of mixture, both quantitatively and qualitatively, in a six or eight cylinder engine, especially if high volumetric efficiency (which means low gas speeds) is demanded at the same time. All solutions of the problem are necessarily empirical and it is therefore little wonder that engineers continually try to better their designs. It has long been the custom to supply the necessary heat for the vaporization of the liquid fuel through an exhaust jacket on the inlet manifold, and that practice is now almost universal; but in recent years it has come to be realized that if the same proportion of the heat of the exhaust is delivered to the jacket on the intake manifold under all conditions, either will the charge be inadequately heated when the engine is cold and the outside temperature low, or the engine power will be materially cut down under the reverse conditions. Therefore, an arrangement of valves by means of which either all or a part of the exhaust gases can be directed through the jacket—in other words, heat control—has been adopted for several additional cars this year.

Little change is apparent in lubricating systems, except in the Packard, in which oil is supplied directly to the cylinder walls through a special manifold from which the oil is sprayed. The practice of drilling a hole in each connecting rod head, which hole registers with a radial hole in the crankpin during a portion of the crankshaft revolution, is also spreading.

Oakland has followed the practice of driving the oil pump and distributor through a shaft which makes an angle of about 45 deg. with the vertical, the two parts being located on opposite sides of the engine. Among the advantages of this arrangement are that the distributor does not have to be taken off when the cylinder head is to be removed, and that the oil pump is outside the crankcase, where it cannot freeze up in cold weather due to moisture in the crankcase, and is accessible without removing the oil pan.

Oil, Air and Fuel Cleaners

Further progress has been made in the adoption of cleaners for all the fluid media that come in contact with the interior surfaces of the engine—oil, air and fuel. The oil filters are now often provided with an automatic by-pass so that lubrication will not suffer materially if the filter should become clogged.

A cushioning support for the powerplant by means of rubber pads or bushings is now a very common feature. Since the water connections are rubber hose and the clutch also comprises insulating members, the engine no longer is an effective ground for the electrical system, particularly as regards the heavy currents drawn by the starting motor, and it is necessary

to ground it specially to the frame, to which the battery is grounded. Another result of using elastic mountings has been that the engine structure no longer serves as a rigid cross member of the frame, and in view of this fact, in the Cadillac an additional tubular member has been provided close to the rear engine mountings.

There have been few changes in clutches. Single-plate clutches are supreme, except for the most powerful cars, in the case of which two driven disks are used. The practice of including a flexible member of non-metallic material in the driven disk to prevent gear shatter is spreading, the Chrysler 62 being one of the cars to have this feature incorporated recently. On the Chrysler 72 the woven-in asbestos cord facing has been replaced by the ordinary riveted-on facing.

Change to Standard Shift

In connection with change gears there is little to record, aside from the fact that two of the largest makers which up to last year had a non-standard shift have changed to the standard; hence, if the new Ford has the standard shift, as appears likely, the controls on practically all cars will be very much alike in the future. One thing on which there is still some disagreement is the location of the emergency brake lever; besides, some of the newer cars dispense with the spark lever and have a lever for the control of the lighting system take its place, which is somewhat embarrassing to the driver accustomed to the old control system with spark and throttle levers on the wheel. Another factor that bids fair to disturb the perfect harmony of control arrangements is the likelihood of a further adoption of four-speed gears, some of which at least have a non-standard control.

An innovation in connection with propeller shafts is found on the new Packard which has a shaft rolled up of sheet steel and welded. Apparently it is possible by this process to get a shaft that is more nearly symmetrical; or, in other words, whose axis of gyration coincides more nearly with its geometrical axis, and which, in consequence, will be less given to whirling.

In line with the endeavor to provide more adequately for the comfort of the driver is the provision for the adjustment of the steering gear angle on a number of cars, notably the Buick and Franklin. Adjustability of pedal lengths is also coming to be a more common feature, and on the new Cadillac the driver's seat is made readily adjustable by means of a ratchet lever on top of the seat back. All of these devices are, of course, intended to make it possible to adjust the control devices to the build of the driver.

The move toward greater reductions in steering gears, which started with the advent of balloon tires and front wheel brakes, continues. Generally speaking, the greater the steering reduction the smaller the degree of reversibility, and it is noteworthy in this connection that one of the conclusions reached by M. Sensaud de Lavaud from a study of the causes of shimmy and wheel wobble is that reversibility is antagonistic to these effects.

Chassis frames have had to be redesigned in a number of instances, largely as a consequence of other changes, the adoption of rubber-cushioned mountings, already mentioned, among them. It appears that the use of a larger number of cross members permits of obtaining the same rigidity with stock of lighter gage, by making the section deeper and perhaps wider, and in at least one instance this plan has been followed. Double drop frames are coming into wide use in consequence of the demand for less over-all height. A reinforcing inner channel is used at the forward end of the side members of the new Cadillac.

Chassis lubrication remains in the same state as previously, no new converts to the central reservoir or dashboard pump system having been announced. But a detail improvement was made on the Buick in that five of the lubricator fittings on each side near the rear end of the chassis were brought close together behind a swing-door-covered opening in the running board apron, where they are more accessible.

Four-wheel brakes are coming to be standard equipment on practically all new cars, and if, as forecasted, the new Ford is equipped with them, it will probably be only a matter of a year before they will be universal.

Wheel diameters still show a downward trend, in response to the demand for reduced over-all heights. Some of the smallest cars are now fitted with wheels having a rim diameter of 18 in. and a tire diameter of 28 in. Even on the largest cars tire diameters have come down to 32 in. with very few exceptions. More attention is being given to the balancing of wheels, as it is known that lack of balance is a direct cause of wheel wobble.

Body designs naturally have received much attention also. In a number of instances radiators have been narrowed or increased in height, or both, evidently to improve the appearance of raciness of the cars. The shape of the louvres in the hood has come to be a point of some importance, and banks of horizontal louvres are found on a number of new cars.

Greater visibility is a feature which has been much stressed in connection with closed cars for the last year or two, and many manufacturers have found ways of narrowing their front corner posts. An attractive arrangement of the instruments in one or more panels has been the object of many designers, and some really artistic layouts have been evolved.

The transmission lock and the coincidental lock acting on the transmission seem to be giving way too a new type coincidental lock free from the inconveniences of the latter. In some cases a steering gear lock is combined with an ignition lock, while in others only the ignition is locked by the act of turning it off.

More Leg Room Provided

In a number of the smaller cars the leg room in the front compartment is increased by forming the dash of pressed steel, with a recess stamped in at the center in which the rear cylinder stands, or else two recesses on the rear side for the legs of the driver and the front seat passenger.

Remote door controls are becoming a common feature on closed cars, enabling passengers to conveniently open and close the doors from their seats. Upholstery of closed cars is now generally in two shades of the same material, one shade for the seat and the other for the roof and interior linings. A type of seat known as the form-fitting or saddle seat is coming into extensive use, the chief advantage claimed for it being that it increases the comfort of riding.

Efforts are constantly being made to strengthen the appeal to the eye, by improving both the form of the bodies and the color schemes, and the greatest progress in this direction during the past year has been made in the low-priced class—perhaps because there was most room for improvement there. Fenders and running boards, which parts have a most important influence on the general appearance, are being substantially improved, the former being made of heavier gage material and the full-crowned type, which eliminates the suggestion of "tinniness" and gives an impression of substantiality.

More Passenger Room Provided in New Urban Buses

Study of exhibits at A.E.R.A. show also reveals trend toward greater luxury in interurban jobs, and further increases in power-weight ratio. Duralumin bodies here.

By Donald Blanchard and James W. Cottrell

PROVISION of more capacity for both seated and standing passengers in buses designed for urban service, greater luxury and comfort in the interurban designs, and still further increases in the power-weight ratio, obtained in some cases by the use of larger engines, in others by improved design and, in two instances, by the adoption of all-duralumin construction, were among the outstanding developments of the bus exhibits at the American Electric Railway Association Show, held in Cleveland, Oct. 1-7.

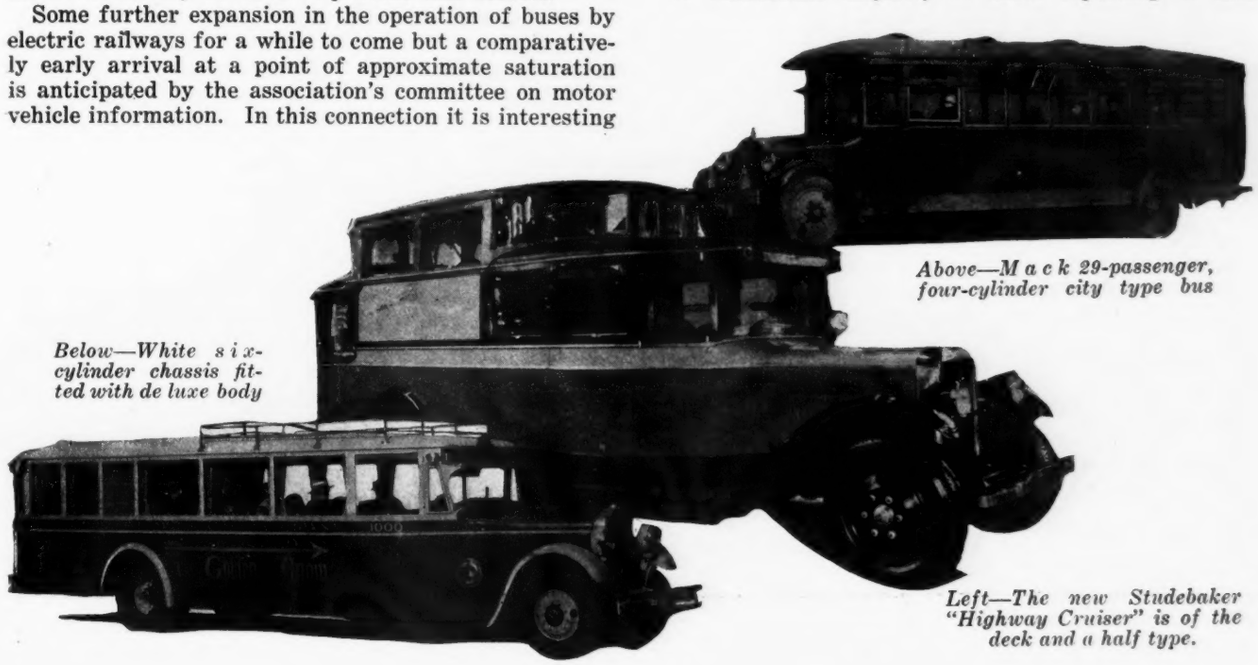
From the automotive standpoint, the most important development of the convention sessions was the adoption of revisions to the Association's constitution making it possible for the so-called "independent" operator of buses to become members. Previously the only exclusive bus operating companies numbered among the membership were those which had abandoned street railway operation in favor of motor coaches. These revisions of the constitution make the association one of urban and interurban transportation companies and allied interests, without any limitation on the type of equipment which may be used to provide this service.

Some further expansion in the operation of buses by electric railways for a while to come but a comparatively early arrival at a point of approximate saturation is anticipated by the association's committee on motor vehicle information. In this connection it is interesting to note that the association's survey shows that 367 electric railway companies are operating 8352 buses as compared with 338 companies operating 6556 buses a year ago.

In general the committee referred to in the preceding paragraph finds that buses will be used chiefly as feeders and to supplement railway operations. Only in small cities does there appear to be any intention of supplanting street cars with buses. Interurban operations seem to be generally more profitable than city service. Urban operations on a 5-cent fare are almost uniformly unprofitable, according to the committee, a fare of 8 and probably 10 cents being required to show a profit.

This committee also finds that bus competition has been substantially checked in city operations but less progress has been made in meeting interurban and interstate competition. In connection with independent operation it was found that the independents are holding on and, when their equipment is worn out, are able to make replacements.

A substantial majority of those reporting to this



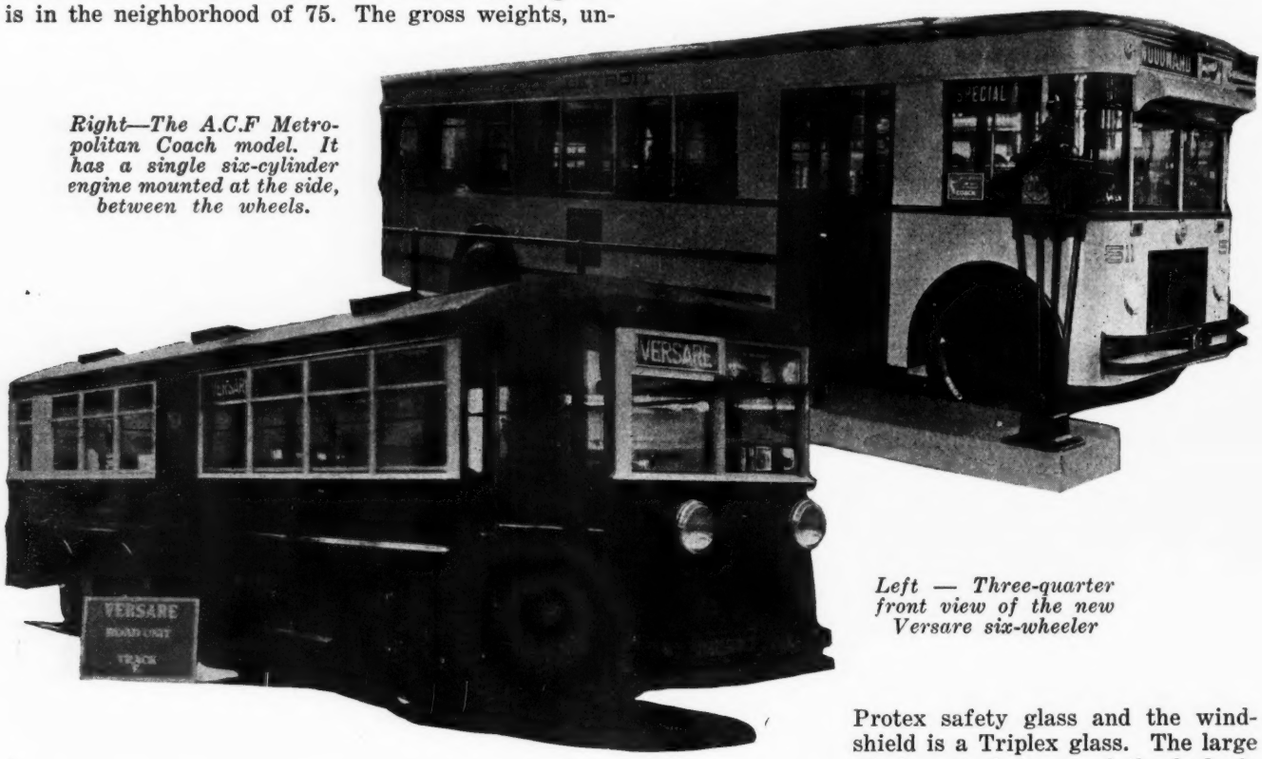
Above—Mack 29-passenger, four-cylinder city type bus

Below—White six-cylinder chassis fitted with de luxe body

Left—The new Studebaker "Highway Cruiser" is of the deck and a half type.

committee exonerate the bus manufacturers from the implication of undue efforts to establish independent competitive operations. A few, mentioning five bus manufacturers in all (who are not named in the report), feel that the latter have not shown indications of sincere cooperation and have lent financial assistance considerably beyond the general practice of extending time payment accommodation to establish independent competitive operations.

Three makers—Twin-Coach, A.C.F. and Versare—showed unconventional designs providing a considerable increase in carrying capacity over anything that has been obtained in the conventional single-deck type. In all three of these models the driver sits at the very front of the vehicle and the frontal appearance bears considerable resemblance to street car practice. In each case the frame is incorporated in the body structure and the entire length is available for carrying passengers. In addition to their greater capacity, a considerable saving in gross weight is claimed. An idea of the capacity of these jobs may be gained from the fact that in each case the combined seated and standing load is in the neighborhood of 75. The gross weights, unloaded, range from 7 to 8 tons.



Right—The A.C.F Metropolitan Coach model. It has a single six-cylinder engine mounted at the side, between the wheels.

Left — Three-quarter front view of the new Versare six-wheeler

Naturally this type of construction excited considerable interest among the railway men at the show, primarily because of the carrying capacity and, at least incidentally, because of appearance. It is a development that is being watched closely by the entire industry and its ultimate effects may be far-reaching.

New six-cylinder, four-wheel brake chassis were exhibited by Reo and Graham Brothers. The six-cylinder engine was again the predominating type, only two makers—Mack and White—exhibiting fours. In addition Hercules, Waukesha and Continental showed new six-cylinder engines, the Continental product being of the push-rod operated valve-in-head type. Gas-electric drives were exhibited by four makers and where the gear-type transmission was used four speeds were provided with few exceptions.

All models at the show were equipped with pneumatic tires, with duals in the rear in most cases. In addition to the exhibit of the Six-Wheel Co., Versare also showed a three-axle design.

A deluxe steam-driven bus was shown by the Brooks Steam Motors, Ltd., Stratford, Ont., Can., of which D. McCall White is chairman of the board and E. H. Delling, director of engineering.

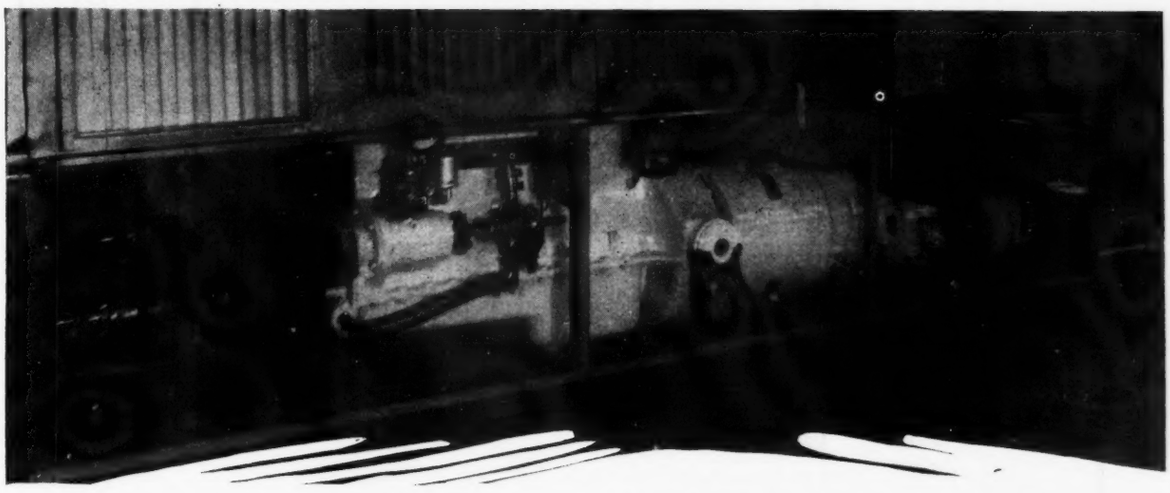
Duralumin Parlor Car Body

One of the most interesting body jobs shown, which created considerable comment not only because of its lightness but also due to its attractive appearance, was the all-duralumin parlor car body built by the Murray Corp. of America. This body weighs 1700 lb. less than the conventional design. It is mounted directly on the chassis without the use of outriggers, and side plates, ribs and unit assemblies have been standardized and can be ordered by part numbers. The design is such that the carrying capacity can be changed by reducing or increasing the number of panel sections in the sides.

In the model shown, all windows were fitted with Protex safety glass and the windshield is a Triplex glass. The large window at the rear of the body is hinged at the top and serves as a safety door in emergency. Exhaust heating is employed but provision is made for warm air to pass up between the inner and outer walls of the body and enter the body through the narrow spaces between the window glasses and the sills, thus preventing frosting. In the job shown, no seats were placed over the wheelhouses but instead this space was used for baggage compartments on either side of the aisle.

Unison seats were installed. This seat is constructed so that the seat and back cushions move as a unit with a compensated spring underneath to take care of variations in passenger weight. This provides flexibility between the seat and the floor of the bus which improves riding. Mack also showed a chair in which the passenger was entirely insulated from the bus by rubber mountings introduced between the seat and its support.

The Versare six-wheel, gas-electric highway unit also



This view shows the method of installing the powerplant beneath the floor in the gas-electric Twin-Coach. It is easily accessible from the outside

had an all-duralumin body which in addition incorporated the frame members. This model has a capacity of 70 passengers, for half of whom seats are provided, and weighs 13,500 lb. Two doors are provided, one opposite the driver and the other near the center of the right side. The power unit consists of a six-cylinder, 4¼ by 4¾ in. Hercules engine with Westinghouse generator, the two being assembled as a unit and mounted transversely at the rear of the body. It is stated that by jacking up the body, rolling a special dolly under the powerplant, removing the muffler and four mounting bolts, the powerplant can be removed in 20 minutes

Each of the three axles are connected to the longitudinal members of the body by a pair of semi-elliptic springs and there is no connection between the two rear driving axles, which are Eaton internal gear units. Each of these axles is driven by an electric motor through a universal connection, the motor being supported from the body in a balanced trunnion mounting.

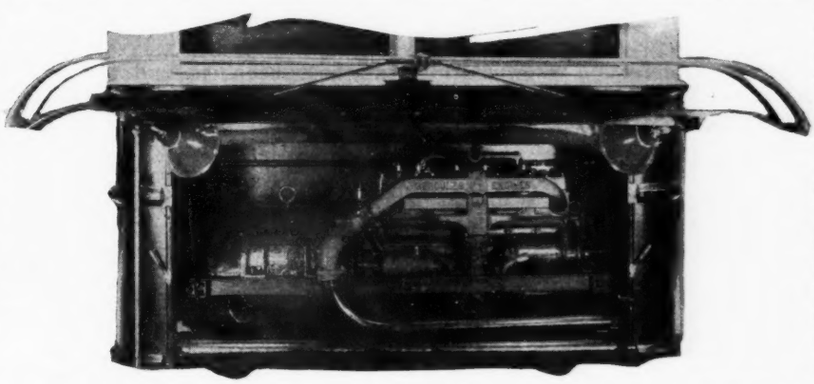
The A.C.F. Metropolitan Coach seats 40 with space for a like number of standees. It also is of the "frameless" type as the functions performed by the chassis side rails in a conventional design are taken care of by members incorporated in the all-steel body. A double door is provided at the front of the body with a dividing rail to separate incoming and outgoing passengers.

The unit powerplant includes a six-cylinder Hall-Scott engine, single-plate clutch and three-speed transmission. It is mounted on the right side of the vehicle just aft of the entrance door and is housed in a metal compartment beneath two double, transverse seats placed back to back. The rear axle is a full-floating worm type.

It will be noted that the door equipment of both the Versare and the A.C.F. models is designed to speed loading and unloading, which analysis of field conditions shows to be one of the largest causes of operating delays. The Twin-Coach also has two doors for the same reason. In addition, a number of makers including Mack, White and Lang showed city-type jobs with front and rear doors on the right side to decrease loading and unloading time.

Passenger comfort is receiving an increasing amount of attention although in some cases seat spacing is not all that the long-legged would desire. Leather upholstery predominated in both the city and deluxe types as did linoleum flooring. In the deluxe type, baggage space normally was provided on the roof. A considerable number of bodies have overhead parcel racks and in several cases these racks are of sufficient size to take hand luggage.

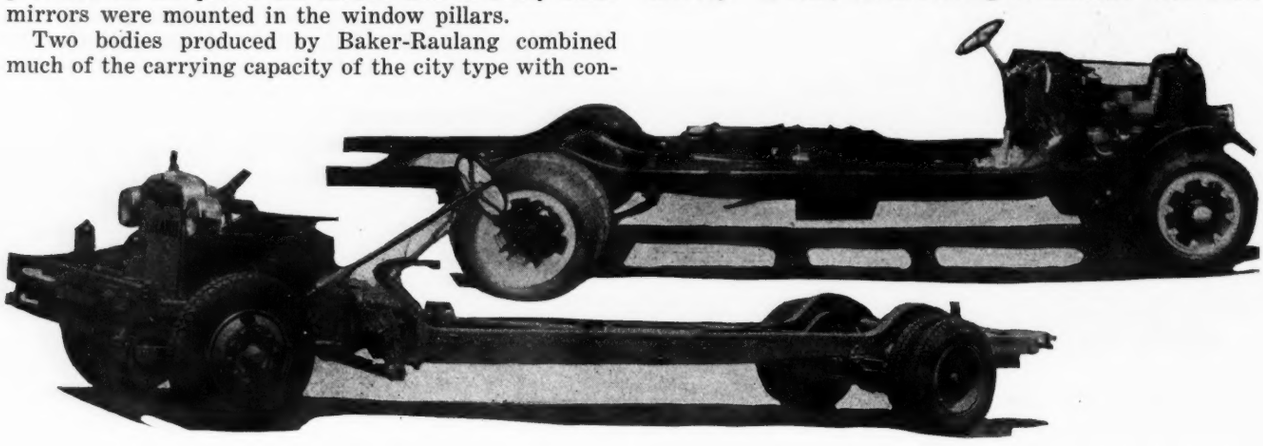
However, several makers are using space inside of the body for baggage. The A. C. F. Observation Coach, of course, uses the space under the raised deck for this purpose. The new Highway Cruiser model shown by Studebaker also is of the deck and a half type, but in this case the raised section is located amidships with seating compartments fore and aft on the main floor level instead of having all of the raised seats at the rear of the body as in the case of the A. C. F. model. Baggage is, of course, carried under the raised portion of this Studebaker model. Another feature is a water cooler, this equipment also being found on the parlor car job shown by White and designed for use in the coordinated rail-bus service recently established between Detroit and Chicago. Another interesting feature of this White job was a lavatory and toilet located over the wheelhouse on the right side, the space over the left wheelhouse being utilized as a baggage compartment. Yellow showed a deluxe job with a compartment at the rear of the body intended primarily for baggage but which was fitted with four folding taxicab seats providing additional



The gas-electric powerplant of the Versare six-wheeler is installed at the rear and is reached by a hinged panel which swings upward and to which the rear bumper is attached

passenger seating capacity. Bender also displayed a body with a small baggage compartment in back of the rear seats. Generally speaking, window drapes were provided on the parlor car models and in many cases mirrors were mounted in the window pillars.

Two bodies produced by Baker-Raulang combined much of the carrying capacity of the city type with considerable of the comfort of the parlor car. This was accomplished by providing proper seat spacing and deep leather upholstery. Overhead racks of sufficient width to take care of hand baggage provided for this requirement. These bodies had a seated capacity of 26 and 29 passengers respectively.



Above—The new Reo six-cylinder GB bus chassis. Below—Gramm six-cylinder chassis

Judging from a census of displays, the most popular sizes are the 29-passenger and the 25-27 passenger capacities, although there were eight jobs exhibited with seats for from 30 to 40. About half a dozen 21-passenger models were shown and about the same number were in the 16 to 19 passenger group. I. H. C. showed 15-passenger models in both city and parlor car types while Fitzjohn had a 12-passenger deluxe body on the smaller Reo bus chassis.

Some mention has been made of the efforts to lighten the bodies. In this connection, it should be noted that the 16-passenger Graham Brothers sedan had aluminum panels and that a large number of body builders employed Haskelite and Plymetl for roofs, body paneling and at the other points to secure light weight combined with strength, as well as attractive appearance.

Air braking, in some cases in combination with metal-to-metal shoe, was shown on 8 or 10 chassis while the vacuum was employed in a number of instances. Incidentally the Westinghouse Air Brake Co. showed its vacuum brake, which is of the Dewandre type, for the first time. Hydraulic brakes are being used on the Yellow X as well as on the Graham Brothers models.

The two new Reo chassis referred to earlier are the FB and the GB. The former model has a wheelbase of 143 in. and has the same units including six-cylinder unit powerplant and four-wheel brakes as the new 1½ ton model described recently in these columns. The GB chassis has a wheelbase of 175 in., B-K vacuum booster operated four-wheel brakes, a four-speed transmission and six-cylinder engine. The smaller model has a drop frame and a single kick-up while the larger job has a double kick-up frame.

An overhead-valve, detachable-head, six-cylinder engine of 4⅛ in. stroke by 4¾ in. bore was shown by Continental for the first time. Maximum output is stated to be 90 hp. at 2500 r.p.m. The crankshaft is mounted in seven bearings with main journals 2¾ in. and crankpins 2½ in.

Hercules introduced a new series of L-head six-cylinder units all having a stroke of 4¾ in. with bores available of 3¾, 4 and 4¼ in. These engines are identical except for the difference in bore and the parts affected thereby. A stiff, seven-bearing crankshaft with 3 in. diameter journals and 2½ in. pins, and an extremely rigid crankcase are features of these powerplants.

The new six-cylinder Ricardo head, 3½ by 4½ in. engine already adopted by Twin-Coach, was shown for the first time by Waukesha. The brake horsepower of this unit is 55 hp. It has a seven-bearing crankshaft and is designed for three-point mounting. Brown-Lipe exhibited a new four-speed transmission for buses as well as a complete line of single plate, multiple lever clutches for motor coach use.

The valves of the Continental engine are mounted in a removable cylinder head and are operated by push rods and rocker arms. The head is of nickel iron and large water passages are provided about the valve seats and spark plug openings. Provision has been made for two plugs per cylinder, if desired.

Cylinder block and crankcase are integral castings of nickel iron. The oil pan is of pressed steel with a capacity of eight quarts of oil. The flywheel housing is separate.

The camshaft is mounted in four bearings, 2⅛, 2 1/16, 2 and 1⅞ in. in diameter respectively from front to rear.

Pistons are of gray iron with four rings. The pin is retained by a ring fitted in a groove in the piston at each end of the pin. A bronze bushing is used in the upper end of the connecting rod.

Lubrication is provided by a gear type oil pump driven from the camshaft by spiral gears. Pressure feed is provided to main and connecting rod bearings, camshaft bearings and to rocker shaft and rockers. Oil pressure is 30 lb. at 1000 r.p.m. Rifle-drilled oil passages in the crankcase form a part of the oil circuit which includes an oil Filtrator.

The front end drive is by gears and either three or five are used, depending upon the type of ignition and generator used. The water pump is located on the left side of the engine and in the three-gear design a battery type distributor is mounted above this shaft and the generator at the end. If magneto ignition is desired this unit is driven by the end of the pump-shaft and the generator is placed on the right side and driven through gears. Right side placing of the generator is also used where the diameter of the unit exceeds 5 in. A starting motor may be mounted on either side of the flywheel housing.

Just Among Ourselves

Conventions Beginning To Liven Up a Bit

CONVENTION season is with us again. The gatherings staged thus far with a few exceptions have generated more real ideas and exhibited more dynamic progress than usual; most of the meetings and shows have been full of life, vigor and practicality. It's a real pleasure to be able to report this, because we have to attend most of these affairs and can't always be so complimentary. Begins to look like a fine progressive winter in all automotive lines. Keen competition is prevailing, to be sure, but to the average forceful, vital sort of man who is holding most automotive executive jobs today that same competition is just as stimulating as is the sharpness of fall air in his nostrils as he strides down for the 8:06 in the morning. Lots of these same men can easily be led into telling you plenty of things that are wrong with business, but if you talk long enough to them a pretty fundamental optimism usually rears its head.

* * *

Can Good Business Be Talked to Death?

CERTAINLY there doesn't seem to be any reason to look for any definite slump in automotive lines in the near future. The last quarter is almost certain to be as good as the last quarter of last year for the industry as a whole and probably will be a good deal better for a number of companies. If any real let-down occurs, some of it probably will have to be attributed to fear rather than to economic forces. Got an interesting slant along this line a few weeks ago from the vice-president of a successful parts concern in Detroit. "How's business look?" we had asked. "Looks very good to me and I see no reason why it shouldn't continue so. But I guess it's going to take a turn for the worse; everybody's talking about slump and if they talk long enough and hard enough that's all that will be necessary to bring it." That idea wouldn't hold water with a professor of economics, to be sure, but it does have in it certain elements of truth. Mere optimism won't change the basic workings of economic law, but it probably can help toward stimulating reasonable, yet confident activity, which in turn tends to keep the business ship on an even keel.

* * *

Labels Have Faculty of Being Inaccurate

THE difficulty of pinning the same label on any large diversified group of men and still have it apply at all accurately to each individual often has impressed us in the past. Nowhere probably is that difficulty better illustrated than in any attempt to talk about labor and industrial relations problems in terms of the "employer" and the "worker." We have been talking to many representatives of each group about just these questions for a good many years now and there's just about one thing that can be said definitely. It's this: The ideas of some workers regarding industrial relations are much closer to those of some employers than to those of many other workers at the other end of the philosophical scale. The same is true of management representatives; the die-hards and big stick operators among the employers are much farther away from the progressive thinkers in the employing group than are these progressive thinkers from certain elements of the worker group. It seems almost certain that continued progress toward satisfactory working out of relations between management and men in the automotive field will lie in the cooperative thinking of those elements in the two groups who are near enough together to permit an intelligent exchange of ideas and a working out of operating policies with some reasonable degree of mutual confidence.

* * *

Regulation of Overseas Flights Probably Unnecessary

HAVING put ourselves on record as opposing the idea of having legislation passed to forbid further overseas flights, we were delighted the other day to hear a high government official confirm that view. "What do the transoceanic flights show?" he said in reply to a questioner. "They seem to me to show that youth and adventure are still with us. That's about all. Restrictive legislation at this time might well do far more harm than good. And also, we must remember, although it sounds a bit brutal to state it, that all progress has come about through a certain amount of sacrifice. Some of the attempts have been foolhardy to be sure, but legislation isn't the way out as I see it." . . Incidentally, while we're talking about aviation, we want to quote the first line of a speech made to the New England Aviation conference recently by Major General John F. O'Ryan: "The history of the human race," he said, "shows that its outstanding characteristic always has been credulity of the mass in relation to superstitions and its incredulity concerning future progress." A neatly turned thought, thinks we.—N.G.S.

Grand Palais, scene of the Paris Automobile Salon

Three French Cars *at Paris* Show Using American Engines

Donnet fitted with Continental, Sizaire-Berwick has Lycoming eight and Sizaire Brothers have adopted a Willys-Knight. Show largest in history with 1200 exhibitors.

By W. F. Bradley

PARIS, Oct. 9 (*special cable to Automotive Industries*)—Uniting 1200 exhibitors, of which 200 are in the car section, the 1927 Paris Automobile Salon, which opened in the Grand Palais on Oct. 6, is the largest in the history of this 21-year-old European institution.

The exhibition brings together the products of every passenger car manufacturer in France, Italy and Belgium, together with 23 American makes and two each from Germany and England.

An outstanding feature of the show is the visualization that it gives of the efforts of all Continental makers to lower production costs with a view to competition in the world's markets. This has brought changes in design which involve extensive adoption of American features.

Six-Cylinder Cars Increase

Six-cylinder engines show an important increase, the show containing at least 60 models with that number of cylinders, the great majority of them having piston displacements not exceeding 122 cu. in., and a good many have a displacement as low as 91 cu. in.

Eight-cylinder engines are 10 in number, compared with only three last year.

Outstanding among new models designed for big production are a six-cylinder Renault 90 cu. in. sedan selling at $1,160; a Donnet with an 83 cu. in. six-cylinder engine built by the Continental Motors Corp., the sedan selling at $1,024; a Mathis 103 cu. in. sedan selling at $1,436; a Fiat Six 136 cu. in. sedan at $1,920, and a Peugeot Six 122 cu. in. sedan selling at $1,593. The lowest-priced six-cylinder American car on the French market is the Erskine sedan, selling here at $1,860.

Contrary to rumors afloat, Citroen has not produced a six but has made modifications in the mechanical design of the four and has produced new body styles, and he still has the cheapest car on the market, his sedan selling at $1,024.

Sizaire-Berwick uses a Lycoming straight-eight engine in a high-grade chassis, while Sizaire Brothers are using the Willys-Knight engine in a chassis having separate suspension for each of the four wheels.

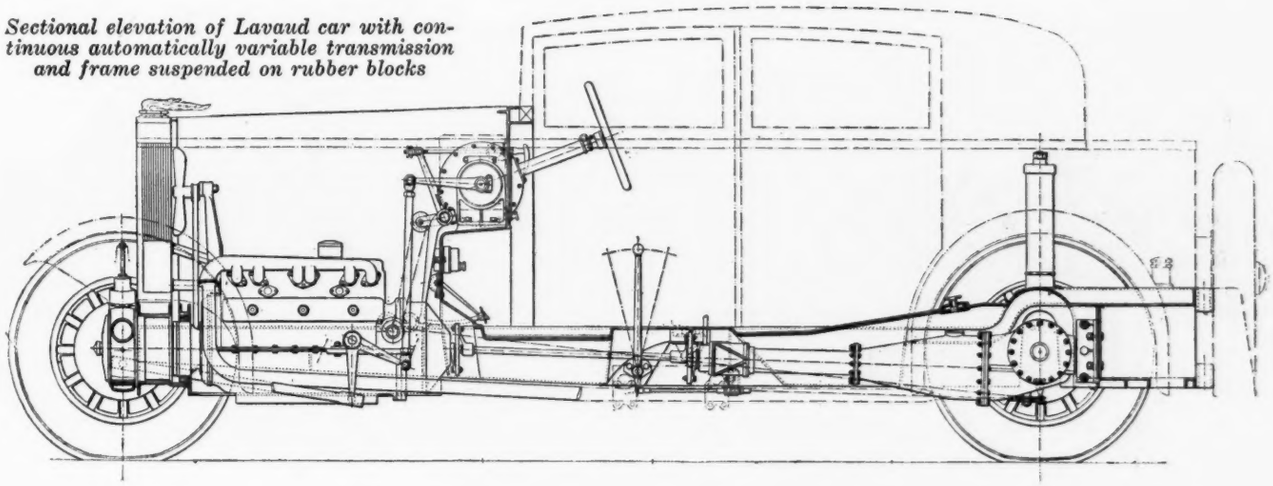
Technical changes in car design, made chiefly with a view to lowering costs, include a return to the side-valve or L-head engine, the adoption of battery-generator ignition, the increased use of steel stampings in place of aluminum castings, and a noticeable return to the Hotchkiss drive.

Oil purifiers and air filters are now used on practically all cars, and a few makers have added oil radiators.

Single unit generator-starters enjoy increased popularity.

The show indicates that more attention is being given to systems of independent springing for all four wheels. Examples of cars using this system of chassis suspen-

Sectional elevation of Lavaud car with continuous automatically variable transmission and frame suspended on rubber blocks



sion are the Sizaire Freres, Cottin & Desgouttes, and Harris Laisne.

Systems of positively steering both front wheels are also to the front.

Sensaud DeLavaud shows an improved type of automatic transmission mounted in a special chassis forming one casting of alpax metal (aluminum-silicon alloy). The car has rubber blocks in closed cylinders in place of the normal laminated springs. With a wheelbase of 128 in. and a closed body the machine is claimed to weigh only 1800 lb. complete. The same automatic transmission has been adopted for the Buc front-drive job. No other automatic transmissions are being shown but it is known that several firms are working on this problem.

A cheap production Berliet has an auxiliary reducing gear at the front end of the driveshaft, giving two combinations of three speeds ahead each. Voisin provides a similar fitting as an optional device, intended for use in traffic and for mountain work.

Centralized chassis lubrication is not in evidence at the show, but since Bijur has placed rights with the Ducellier Corp., a large French accessories firm, the indications are that it will appear next year.

Body tendencies are reflected by an increased number of closed cars. Straight side bodies without valences, giving an unbroken line from the roof down, in some cases avoiding the use of running boards, are a feature.

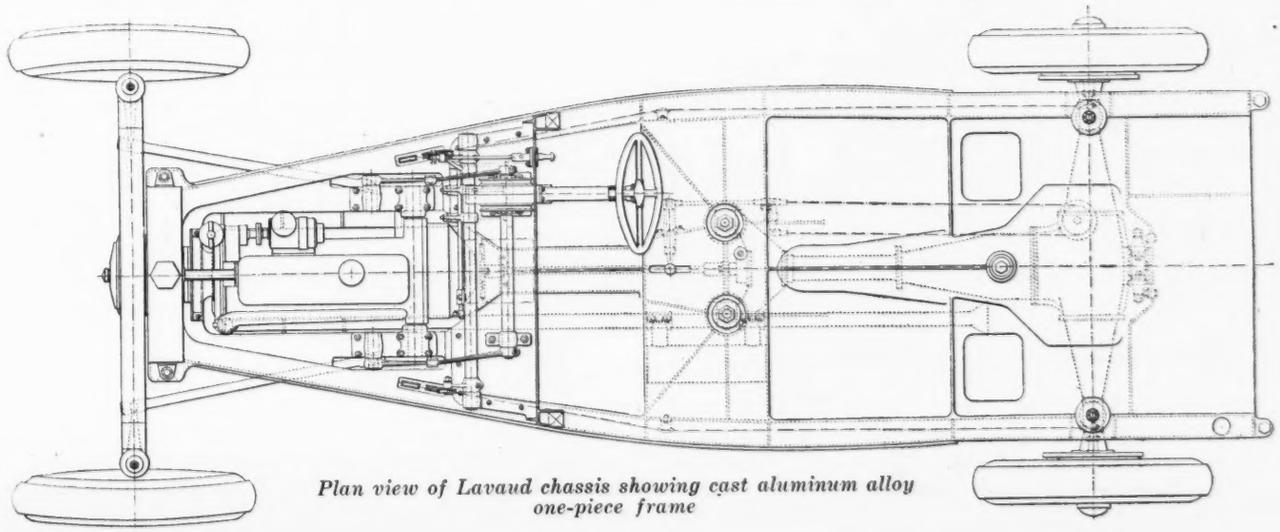
Even on the cheapest cars trunks are now a standard part of the rear of the body.

Fabric leather bodies have maintained their position and Weymann is now producing cheap bodies of smooth leather painted with nitro-cellulose and having aluminum moldings. Such bodies have the bright appearance of a metal body.

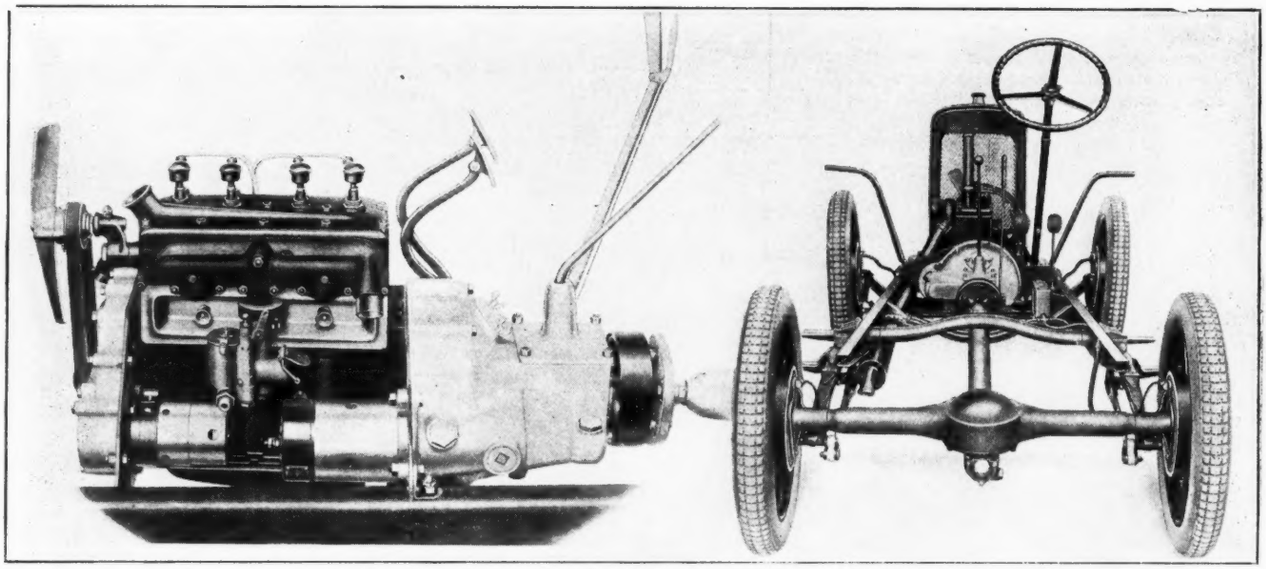
Many sedans are now being built with sliding or collapsible roofs and some are of very interesting design

Another Article Coming

IN the accompanying cablegram Mr. Bradley has not attempted to do more than summarize the major trends and developments noted at the Paris show. In an early issue, however, he will present a second article containing detailed descriptions of some of the cars he mentions but briefly in the cable, and discussing the various new features of design.

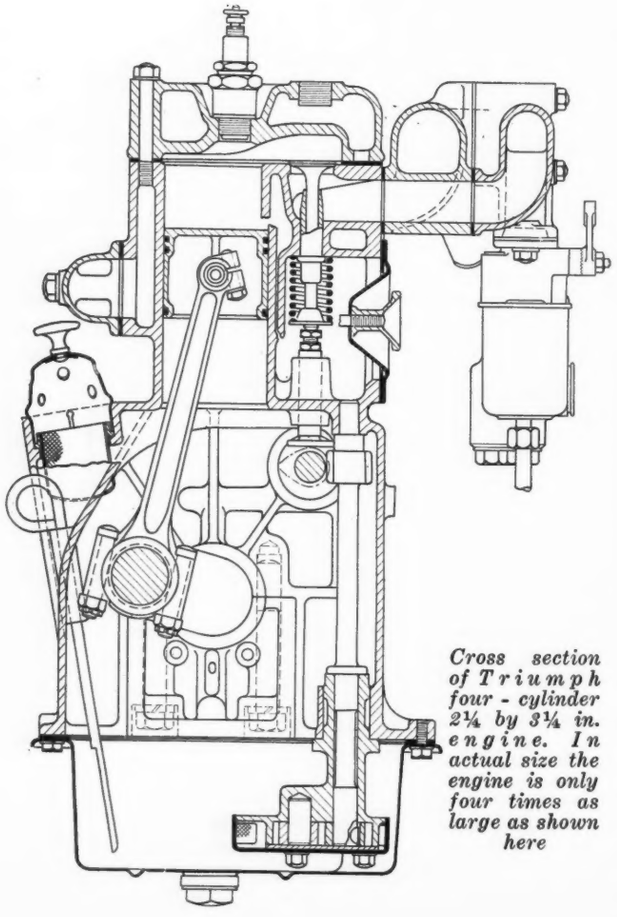


Plan view of Lavaud chassis showing cast aluminum alloy one-piece frame



Powerplant of the Triumph Super-Seven with 50 cu. in. engine, and rear view of the chassis. The latter weighs only 670 lb.

Triumph in *British Small Car* Field With *50* Cu. In. Model



Cross section of Triumph four-cylinder 2¼ by 3¼ in. engine. In actual size the engine is only four times as large as shown here

Car with four-passenger fabric sedan body, 81-in. wheelbase, 42-in. track and with a chassis weight of 670 lb. will sell for less than £150. Develops 21 hp. at peak.

By M. W. Bourdon

THE phenomenal success of the Austin Seven, which has a 45 cu. in. engine, a wheelbase of 75 in. and a track of 40 in., and has had an output this year of 600 per week, has led several other British makers to develop similar models. So far the only competitor in this field has been the 8 hp. Singer with a 52 cu. in. engine, but now the Triumph Motor Co., long prominent in the British motorcycle industry, has entered it. The Triumph firm first entered the car industry some three years ago with a 132 cu. in. four and is still maintaining its position in the motorcycle field.

As far as mechanical details are concerned, the new Triumph car is a high grade job throughout, despite its being designed to sell with a small four-passenger body at less than £150 (the Austin Seven, seating two adults and two children, sells at £135, and the Singer Eight, for four adults, at £140). All three makes are being supplied with sedan bodies of both the fabric and the paneled types.

The original Triumph (the 142 cu. in. four) had an engine designed by Ricardo, with the type of combustion chamber conceived by the latter and with masked inlet valves. These features are not retained in the Seven engine, which was designed by Arthur A. Sykes, A. M. I. A. E. It has a displacement of 50 cu. in. and develops

21 hp. at 4000 r.p.m., the torque reaching a maximum of slightly over 35 lb. ft. at 2000 r.p.m., corresponding to a b.m.e.p. of 104 lb. p. sq. in.

The three-bearing crankshaft has a diameter of 1¼ in. for its crankpins and journals. The latter are 1¾, 1¼ and 2 in. in length, respectively, from front to back, while the crankpins are 1⅛ in. wide. The camshaft also has three bearings in the cast-iron crankcase and cylinder block unit, which is continued for 3 in. below the crankshaft center line and supports a pressed steel underpan with an intervening filter tray.

Distribution is effected by two roller chains, one driving the flange-fixed dynamo behind the distribution case on the left, with slotted holes for chain adjustment, and the other triangulated to drive the camshaft and the magneto, the latter also flange-fixed on the right. The tension of this second chain is automatically maintained by an idler sprocket with an eccentric mounting, a flat steel coil (clock) type of spring being used to keep the sprocket up to its work. The camshaft is located endwise by grooves in the end bearings which the half section or plain-ended set-screws engage. Flat-ended tappets with guides in the cylinder casting are used, the valves having single springs with split cone fixings; inlets and exhausts are interchangeable with a head diameter of 1 in.

The aluminum pistons are straight-sided, 1 15/16 in. in length and have two rings in the head and one in the skirt, while the piston pin, floating in the piston bosses, is secured to the small end of the duralumin connecting rod by a pinch-bolt.

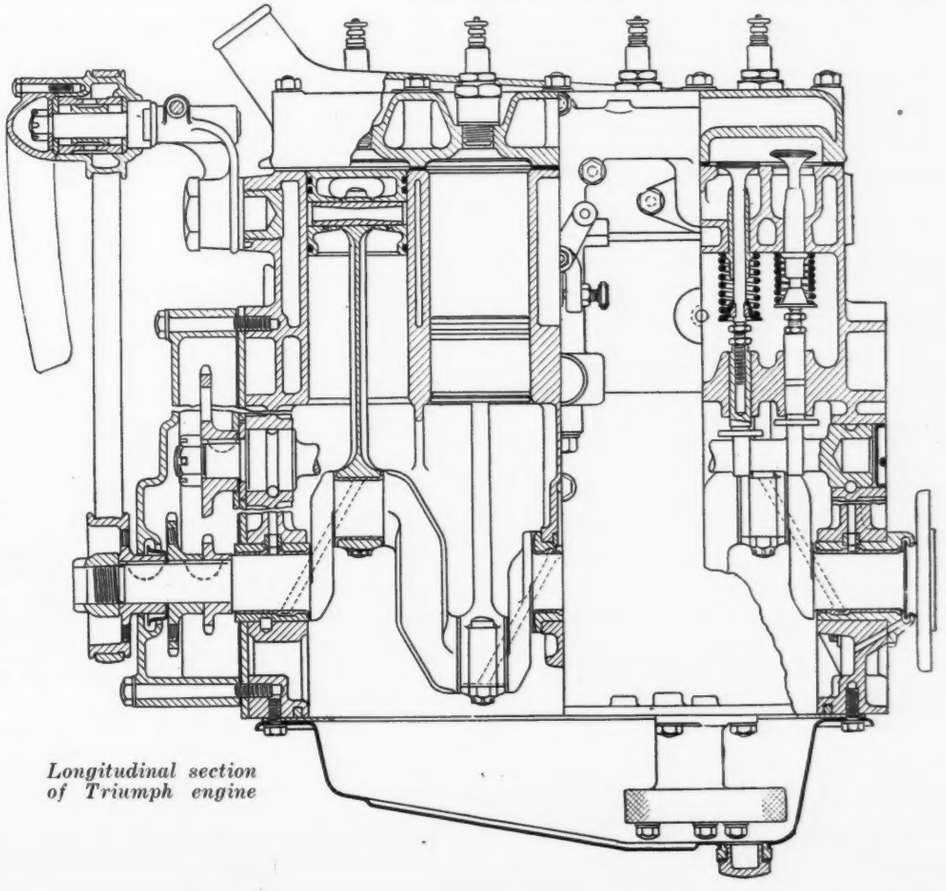
Engine lubrication is by pressure throughout, a gear type pump being submerged in the underpan and driven by skew gearing from the camshaft. No internal piping is used, the pump delivery passing upward through the pump shaft casing to ducts in the main casting leading to the crankshaft journals and through drilled holes in the webs to the crankpins. Leads are also taken to the camshaft bearings, while the chain distribution receives oil from the pressure release valve.

Cooling is by thermo-syphon and a three-bladed fan.

A vertical type Zenith carburetor is used with a two-port induction manifold having central contact with the four-port exhaust manifold. The engine, clutch and gearset unit has a four-point support on the main frame, effected by flat steel cross members interposed between the crankcase and the timing case and bell-housing respectively. The bell-housing and gear casing form a unit casting in aluminum with an over-all cover for the gearset carrying a central gear shift lever. The bell-housing incloses a steel flywheel with the starter gear integral and a single-plate clutch with nine springs, self-contained as to end pressure. Plain bushes are used for the pilot bearings of the clutch and gearset and also for the layshaft of the latter, though the main shaft has ball journals.

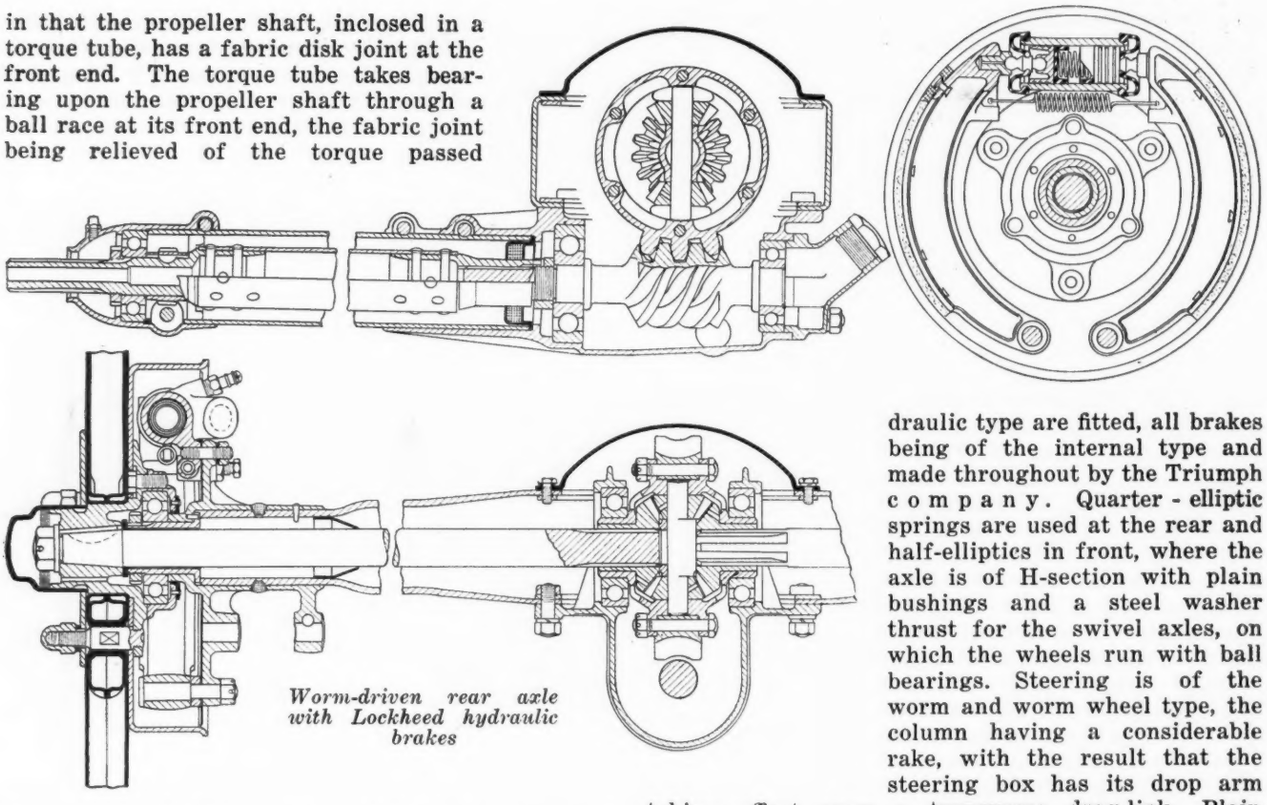
Triumph Super Seven with fabric sedan body

The transmission to the rear axle is somewhat unusual



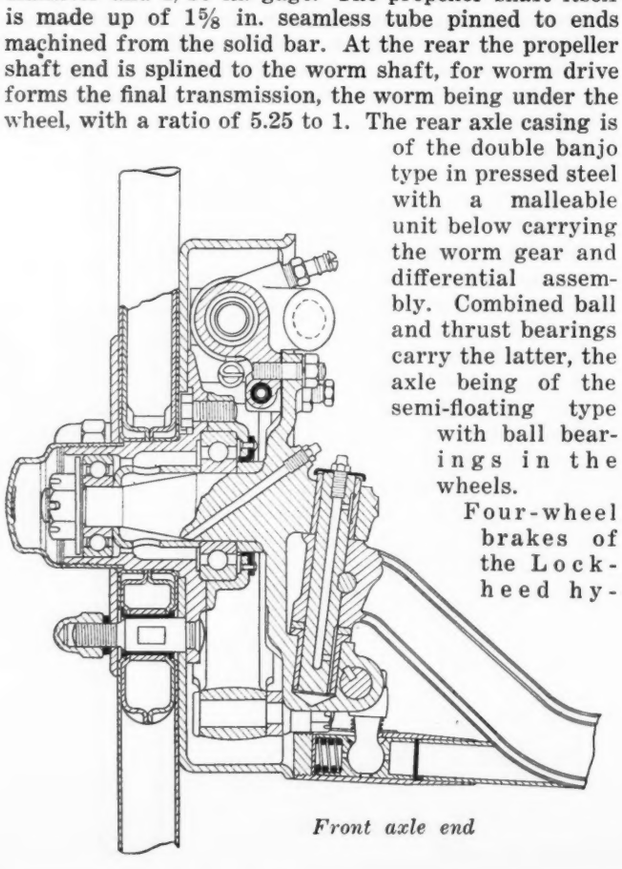
Longitudinal section of Triumph engine

in that the propeller shaft, inclosed in a torque tube, has a fabric disk joint at the front end. The torque tube takes bearing upon the propeller shaft through a ball race at its front end, the fabric joint being relieved of the torque passed through the shaft by reason of the latter having a central spherical pilot bearing in the driving spider of the joint.



Worm-driven rear axle with Lockheed hydraulic brakes

A skew gear speedometer drive is taken from the propeller shaft just behind its front bearing in the torque tube, the latter being a seamless steel tube of 2½ in. diameter and 1/16 in. gage. The propeller shaft itself is made up of 1⅝ in. seamless tube pinned to ends machined from the solid bar. At the rear the propeller shaft end is splined to the worm shaft, for worm drive forms the final transmission, the worm being under the wheel, with a ratio of 5.25 to 1. The rear axle casing is of the double banjo type in pressed steel with a malleable unit below carrying the worm gear and differential assembly. Combined ball and thrust bearings carry the latter, the axle being of the semi-floating type with ball bearings in the wheels.

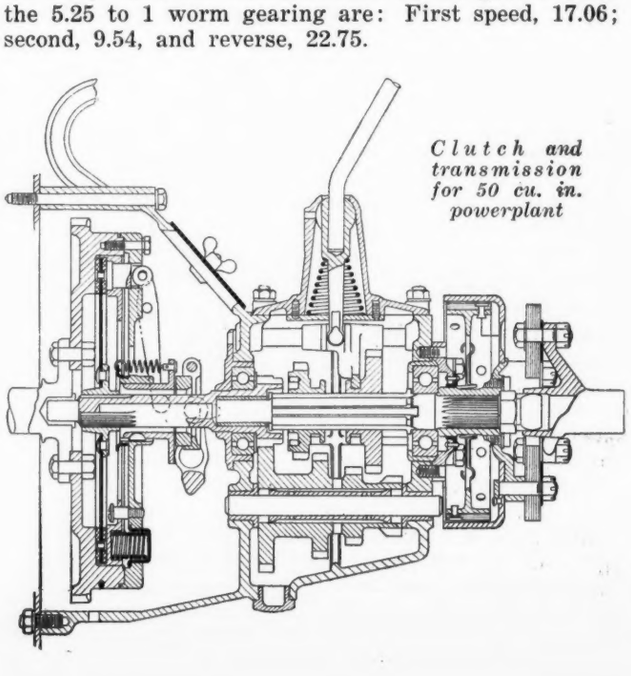


Front axle end

Four-wheel brakes of the Lockheed hydraulic type are fitted, all brakes being of the internal type and made throughout by the Triumph company. Quarter-elliptic springs are used at the rear and half-elliptics in front, where the axle is of H-section with plain bushings and a steel washer thrust for the swivel axles, on which the wheels run with ball bearings. Steering is of the worm and worm wheel type, the column having a considerable rake, with the result that the steering box has its drop arm taking effect upon a transverse drag-link. Plain thrusts and plain bushes are used in the steering gear, the worm wheel being mounted on its shaft by means of a taper, a Woodruff key and lock nut. The steering column is tubular and carries the ignition control and horn switch above the wheel.

Straight channel side rails are used for the frame.

Fuel feed is by gravity from a dashboard tank containing 4½ Imp. gallons. The wheels are of the pressed steel hollow-spoked type bearing 27 x 4.4 in. Dunlop low-pressure tires. The wheelbase is 81 in., track 42 in., overall lengths 108 in., ground clearance 8 in., overall height of sedan 62 in., chassis weight 670 lb. The bore and stroke are 2¼ in. x 3¼ in., the compression ratio 5.1 to 1, while the indirect ratios in the gearset with the 5.25 to 1 worm gearing are: First speed, 17.06; second, 9.54, and reverse, 22.75.



Clutch and transmission for 50 cu. in. powerplant

American Vehicles *Now* Assembled *in* 25 Foreign Plants

Number of such plants has more than doubled in last three years. Saving in ocean freight, lower duties and cheaper labor are among advantages gained.

THE rapid increase during the last three years in the number of branch assembly plants operated in foreign countries by American automobile manufacturers is one of the striking features of our overseas trade development during that period.

The U. S. Bureau of Foreign and Domestic Commerce points out in *Commerce Reports* that, whereas in 1924 there were only 10 American automobile assembly plants in foreign countries, by 1927 the number had increased to 25. Irving H. Taylor, assistant chief of the Automotive Division, who treats the subject at some length, says:

The benefits to be derived from assembling American-type cars in foreign countries are obvious. The most important of these are the saving in ocean freight on shipment of disassembled parts; the saving in duty by reason of the fact that many countries assess a lower rate on parts for assembly than on completely set-up cars; the ease with which distribution to nearby dealers is facilitated through local assembly; the ability to adhere more closely to local preferences in construction or equipment; and, in many markets, the advantage accruing from the lower cost of labor and material. All of these benefits have accomplished much in strengthening the position and increasing the demand in our principal export markets for American cars.

Whereas in 1924 there were branch American automobile-assembling plants only in England, Denmark, Belgium, Spain, France, the Irish Free State, Argentina, and Brazil, now similar operations are being carried on also in Germany, Mexico, Japan, Australia, the Union of South Africa, New Zealand, Uruguay, and the Dutch East Indies. Moreover, the number of these branch plants in several of the countries has been increased.

Advantage has been taken of the "free port" facilities available in many countries. Such accommodations permit the American manufacturer to assemble his cars at a foreign port without the payment of a local customs levy until the completed cars are actually consumed within the country. Utilization of such "free ports" has resulted in the establishment of assembly plants at strategic centers of distribution, these plants to supply cars to a group of adjacent markets—in many cases because of savings realized—at prices much lower than could be quoted on cars fully assembled in the United States.

Foreign-assembled cars are playing an increasingly important part in the broadening of our foreign markets.

During the first half of 1925, about 257,000 American cars were sold to foreign consumers (this total includes all foreign-assembly sales), and approximately 35 per cent of these were produced in foreign branch plants. The comparable total for the first six-month period in 1926 was 263,000, of which 36 per cent were foreign assembled. Up to July 1 in 1927, the total was close to 307,000 and included about 120,000, or 39 per cent, of foreign assembly.

There are a number of minor American car assembly plants operating in various parts of the world, the sales from which are not included in this study. Likewise there are many so-called "set-up" or "service" plants abroad, American controlled, where partially disassembled cars are put into final shape for the consumer. If the total of sales from these other plants were considered, then it would be found that almost half of the American cars absorbed in foreign markets have a high foreign-labor or foreign-material content.

Reports received in the Automotive Division indicate that during the first six months of 1926 there were in operation 17 American branch automobile plants abroad and that during the period 95,836 cars were assembled and sold from these sources. As the number of assembly plants increased to 25, up to July 1, 1927, so the number of sales from these factories advanced to 119,667 during the January-June period of 1927. This represents an increase of about 25 per cent in the sale of American cars assembled abroad.

The table that follows sets forth the types of automobiles assembled abroad during the first half of the current year. It is worthy of note that passenger cars account for more than half of the total, with the open types well in the lead.

Sales abroad of foreign-assembled cars of American type, during first six months, 1926 and 1927

Type	January-June, 1926	January-June, 1927
Passenger cars:		
Open	(1)	51,400
Closed	(1)	15,859
Chassis	(1)	4,569
Trucks	.....	47,609
Type not identified	95,836	230
Total	95,836	119,667

[1] Included in "Type not identified."

There follows a table which clearly indicates the monthly sales trend of foreign-assembled American cars and the types of these cars during the first six months of 1927. It will be seen that open-type passenger cars and trucks predominate throughout the period, the former being in the lead except during March and June, when truck sales occupied first position.

Types of foreign-assembled American cars sold during first six months of 1927

Type	January	February	March	April	May	June	Total
Passenger cars:							
Open	7,845	8,009	8,331	9,136	9,964	8,115	51,400
Closed	825	1,129	2,519	3,629	4,141	3,616	15,859
Chassis	693	588	953	859	853	623	4,569
Trucks	5,580	6,363	8,978	8,640	9,532	8,516	47,609
Type not identified	....	.....	230	.....	.....	.....	230
Total	14,943	16,089	21,011	22,264	24,490	20,870	119,667

Flying is becoming an old story to the Cleveland Pneumatic Tool Co. This, its latest acquisition, is a Ryan Brougham. Note navigation lights built into wing

Edward F. Schlee, left, and pilot William F. Brock a few minutes before the take-off on their round-the-world flight in a Stinson monoplane

"Company Plane" an Institution Now in Many Automotive Plants

By A. F. DENHAM

NOT only are the men who build and sell automobiles and automobile supplies rapidly extending their activities to the manufacture of aeronautic products, such as complete airplanes, engines, and other parts and accessories, but they are also adapting airplanes to their business needs and operating them for the execution of pressing commercial errands.

An airplane hangar near an automotive plant is no longer a novelty. A rush order for parts, a situation in some distant city which demands the immediate presence of an executive officer of the company, frequent routine trips between widely-separated plants —on such occasions hours of valuable time are saved by telling the company pilot to "haul 'er out."

Much, of course, has been written about the use that Ford has made of airplanes in his business. For some time past he has carried on regular scheduled airplane service between headquarters in Detroit and important Ford branches in several other cities. Little is known or appreciated, however, of the activities of the score and more other automotive concerns who have coordinated the airplane and its capacities with the activities of their organizations.

One of the real romances of this year's flying is that of the Ford plane operated by the Standard Oil Co., the "Stanolind." This plane, between its acquisition at the end of May and the beginning of August, had covered some 14,000 miles, carrying 700 passengers. It has been used almost exclusively by executives of Standard Oil of Indiana to enable them to make faster trips to oil producing regions, division headquarters and outlying refineries. This plane, the latest type of Ford trans-

Edward G. Seubert, president, Standard Oil Company of Indiana, greeting Col. Robert M. Stewart, chairman of the Board of Directors and other officials upon their successful maiden trip in the company's Ford transport

port, is equipped with three Wright Whirlwind engines. Some idea of the comfort of travel is conveyed by the cabin equipment provided. In addition to upholstered seats in the forward part, the rear of the cabin is equipped with three berths which may be made into comfortable beds at night or converted into roomy divans in the daytime. Behind the after cabin are completely equipped washrooms, toilet and baggage compartments.

For night flying the plane carries the standard navigation lights and also a pair of searchlights under the wing tips for use in landing. Cabins of course are also electrically lighted, with a storage battery as the source of electricity. Daytime travel, however, predominates, due to the lack of sufficiently nationwide airway lighting.

E. G. Thompson, vice-president of Thompson Products, Inc., shown with that company's first plane, a Whirlwind Laird

The reliance which is placed on this plane is illustrated by a trip taken by the complete board of directors in July. It was necessary that the entire board be in Denver on July 24 for an important meeting, so they took off in the Stanolind at 5 a. m. from Chicago, and landed in Denver at 5 p. m., 912 miles by air, with three stops for fueling en route. Leaving Denver the next morning at 11 a. m. the plane was flown to Kansas City, arriving there at six. Here another important business meeting was held the next morning. At 12.30 the plane took off once more and returned the directors to Chicago at five o'clock in the afternoon.

Another rather well-known plane is the three Wright Whirlwind-engined, 10-passenger Fokker monoplane owned by Continental Motors and used by its executives, notably Messrs. Angell and Judson, for trips between the Continental plants in Muskegon and Detroit. Before the purchase and operation of this plane, executives had either to take two night trips on a train, or else spend a night at Muskegon, since the trip by rail consumed seven hours. Through the purchase of the airplane executives can now fly to Muskegon in the morning, transact business there and return to Detroit several hours before the office closes, since the trip by air has reduced time in Detroit to two hours each way. This plane also has passed the 10,000 mile mark in flying, including a trip to the Pacific Coast and return to call on Continental customers, the trip requiring only 48 hours total flying time. Undoubtedly operations of this plane will also prove of value to Continental in the development of its airplane engine.

Executives of another automobile manufacturing concern, the Marmon Motor Car Co., have recently taken to the air in a "Whirlwind" Fokker. Here again the time saving idea predominates. In addition, at least two more automobile manufacturing concerns may soon demonstrate that they have become airminded, since it is understood that E. L. Cord of Auburn, and Russel Boynge of Chevrolet are acquiring airplanes. While Cliff Durant and Henry Dupont both use airplanes, these are mostly personal adventures, although both use their planes for business trips. Both use single-engined (Wright Whirlwind) Buhl Airsters.

Besides the Standard Oil, we can think of at least three other oil companies who have entered the airplane operating field. Leading these is the Wayco Oil Co.,

There is rarely an idle day for this Fokker monoplane owned by Continental Motors, and used by Ross Judson and... Angell and other officials in lieu of rail transportation to the Muskegon plant and outlying customers

whose president, E. F. Schlee, has spent almost as much time in an airplane of late as he has on the ground. His entry in the Ford Reliability Tour, in which Eddie Stinson piloted him, Mrs. Schlee, and their young daughter throughout the entire tour, was the winning entry. Hardly had the tour been completed

Thomas F. Colby in his Waco 10, shown here, has visited practically every part of the United States by air. He is manager of the Aviation and Marine Department of Berry Brothers, varnish and lacquer manufacturers

than Mr. Schlee with Pilot Brock hopped off on a round-the-world airplane trip. Stinson Detroiters seem to be Mr. Schlee's forte. They are of the monoplane type and use the evidently Wright Whirlwind engine. Mr. Schlee's personal activities along this line do not complete the story of the Wayco Oil Company's aerial activities. Three more Stinsons are operated by this organization as Detroit's first aerial taxi service.

Turning to Abilene, Texas, we find Deane Gill, a director of the Manhattan Oil Co., having discarded his automobile and train tickets in favor of airplane travel. Mr. Gill has a Travel Air biplane in which he averages 110 m.p.h. with his Wright Whirlwind engine. This motor had some 295 hours of service up to the beginning of August, which would give the ship a total mileage of 30,000 miles or better. "I have had this ship all over all the oil fields of Kansas and Texas," Mr. Gill writes us, "using it almost entirely to do my traveling to the fields in west Texas and our main office in Kansas City.

A "Whirlwind" Travel Air for business trips also takes an important part in the travels of W. E. Howell, of Wichita, Kansas, another oil man.

Lacquer Industry in the Air

Thomas F. Colby, of Berry Brothers, represents the lacquer industry in the air. Mr. Colby, who is manager of the aviation and marine department, has the whole United States as his territory. "With an airplane," he says, "I can cover it alone, otherwise several men would be needed. Mr. Colby uses a Waco 10 biplane powered with the Wright Whirlwind.

Even in the portable electric tool field we find the airplane tying in. Mr. Roth, Pacific coast representative of Black & Decker, uses an airplane as a traveling sample case.

Then there is another tool concern, the Cleveland Pneumatic Tool Co., represented by E. W. Cleveland in the automotive group, demonstrating that flying is safe. The company owns a number of planes. A Waco represented it in the last National Reliability Tour, and its most recent acquisition, a Ryan Brougham, the "Lindbergh" type plane, powered with the Wright Whirlwind, participated in the recent On-to-Seattle race preceding the National Air Races there. Included in the equipment of all planes owned by the Cleveland Pneumatic Tool Co. are "Aero Struts," a pneumatic type of shock absorber marketed by a subsidiary of this concern, the Cleveland Aerol Co.

Another important contributor to the automotive industry, Thompson Products, Inc., is also getting in good ground work for future extensive flying in connection with its business. This company has purchased a Laird biplane powered with the well-known nine-cylinder radial air-cooled engine of 220 hp. More will be purchased in the near future. The company will have an "air travel activities" manager. Better contact between Detroit and Cleveland plants and customers at other points is the object. E. G. Thompson, president, is definitely sold on the idea. "The time has arrived when the airplane deserves serious consideration as a self-supporting and practical asset in any modern manufacturing business," said Mr. Thompson.

It only remains to see what those who are concerned with the selling of the finished product are doing. And here we find an even wider application of the airplane. Not only is this means of transportation used for delivery of parts, or calling for salesmen who have driven cars for delivery to distant customers, but we find an increasing number of automobile dealers actively engaged in selling airplanes.

Jack Maddux, Los Angeles Lincoln distributor, who has a Ford tri-motor demonstrator, has already listed a good many prospects for Ford airplanes. Another, L. H. Hall, president of the Hall Garage Co., Chrysler distributor and jobber for Firestone tires, located in Wausau, Wis., writes us that they have been very successful in selling Alexander Eaglerock planes. These airplane sales are handled through the Hall Aircraft Corp., of which Mr. Hall is vice-president.

Then there are three Buick dealers and distributors we know about with whom airplane travel is part of the regular business routine. Walt Story, distributor for the State of Wyoming, uses J. Don Alexander's Eaglerocks. William F. Burke, dealer for Okmulgee, Okla., swears by Whirlwind Travel Airs, and Tom Alton, distributor in Columbia, Mo., says that "When better airplanes are built we will fly them."

The Alexander Aircraft Co. also tells us that Capt. R. L. Copsey, Cadillac distributor for Wyoming, and A. R. Borne, Nash distributor for the city of Los Angeles, use its planes for business purposes.

No attempt has been made to provide a complete list of all automotive concerns who use airplanes in the conduct of their business, but enough instances are given to indicate clearly that the adoption of the airplane as an automotive business tool has become quite widespread and is certainly not confined to a few haphazard cases.

Novel *Method* Produces Perfect Fit Between Worm *and* Gear

Final finishing of Jordan gears is done with burnishing tool which is exact reproduction of standard worm. Finish obtained is same as after 2000 miles on road.

By K. W. Stillman

THE production of gears by the hobbing method has always been recognized as a sort of mechanical approximation to accurate work. If economical tooling is to be accomplished it must be possible to regrind the hobs several times before they become too small for use and this condition makes it necessary to make the hobs larger than the nominal size at the outset.

In the production of gears for use with worms in automotive drives this condition has particularly serious aspects since any excess amount of play between the worm and gear is a source of noise and rapid wear. In such installations it is possible to produce worms which are accurate within exceedingly small limits, but it has often been necessary, in order to fit the gear to the worm properly, to give the assembly a long running-in period or else send the car out with noisy gears but with the assurance that after it has been run several hundred miles they would quiet down.

This problem has been solved in a very interesting manner by the Columbia Axle Co. of Cleveland, which supplies the worm drive axles for the Jordan Model R cars. In hobbing the gears they are left from .002 to .004 in. large on the radius in order to provide sufficient stock for the running-in process to be described.

The first operation in the shop running-in process is to check the gears in a fixture in which they are held on centers against a standard worm in the exact position to which they must be fitted in the car. This inspection is made principally to provide the operator with information as to about how long the running-in must be continued in order to bring the gear to exact size.

The Running-in Machine

The running-in machine consists essentially of a set of fixtures in which the gear can be placed on exact centers with a burnishing tool which is an exact reproduction of a standard worm. The burnishing tool is operated by a 15 hp. electric motor while the gear shaft is equipped with brakes by means of which loads of varying amounts can be applied.

The gear is placed in position on its shaft, a lever being used to lower the burnishing tool so that the gear may be placed in position. The tool is then raised to position in exactly the same relationship to the gear that the worm will have in the assembled axle and the power is turned on.

The threads on the burnishing tool are accurately ground to duplicate in contour the threads of the production worm and they are serrated to give the effect of an unrelieved hob. This tool, therefore, acts with a slight cutting effect if there is any discrepancy in the gear teeth or any other irregularities due to inaccurate cutting or machine chatter. After this, it is evident that the tool will act as a burnisher which condenses the metal of the gear teeth and causes it to flow until it fits perfectly with the threads of the burnishing tool.

By applying loads of various intensities through the medium of the brake on the worm wheel shaft, the operator is able to hasten or retard the burnishing operation, depending upon how far the gear was originally from perfection. The primary inspection gives the operator an indication of how much metal must be removed or condensed in the burnishing process and experience tells him about when the work should be completed. After taking the gear out of the machine it is again checked on the inspection device mentioned before and is returned to the burnishing machine for further working if it has not reached perfect condition.

Condensation of Metal

Microphotographs taken of the gear teeth after undergoing this burnishing process show a marked condensation of the metal and, in fact, the surface of the teeth appears to have a structure resembling a fairly deep case. Both laboratory and road tests have demonstrated the fact that after burnishing the gear teeth have a density, smoothness and wearing quality to start with which are commensurate with those of a gear which has been actually run on the road for about 2000 miles. Also there has been a definite improvement in the wearing ability of gears passed through this burnishing operation.

In addition to these advantages the burnishing operation produces gear teeth with glass smooth surfaces and whose contact with the worm is practically perfect clear across the face of the teeth. This has eliminated offangularity with its resultant high pressure at localized points which has been one of the bugbears of previous practice.

The main purpose of the burnishing process, and the reason for its original development, is to turn out gear sets which would not require any roading before they run quietly, and this, apparently, has been accomplished in much less time than it could be done by any other method in common use.

A PLAN for the construction of an automobile road from Hamburg, Germany, to Genoa, Italy, is at present under consideration. The road is to pass through Frankford-on-Main, Balse, Chiasso, Milan and Voghera. It is reported from Milan that the engineer Puricelli, who designed the special automobile roads in Upper Italy and for the Monza automobile track, has been commissioned to work out plans for the new road.

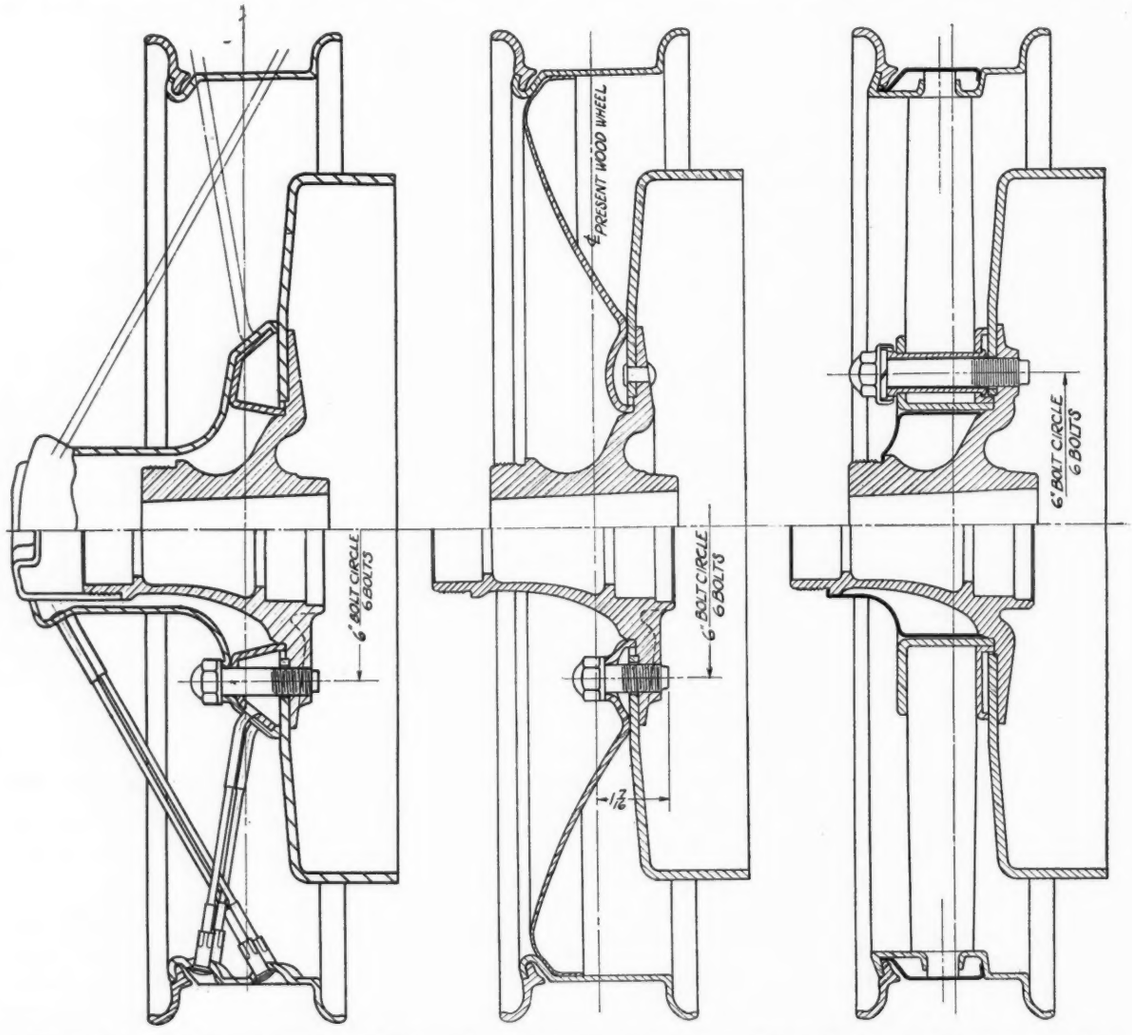
Interchangeable Wood, Wire *and* Disk Wheels Now Available

Are of demountable type and fit same hub. Greater strength and lightness are features. Marketed for original equipment by the Motor Wheel Corp.

A COMPLETE new line of demountable wheels—wood, wire and disk—all interchangeable on the same hub, is now being marketed for original equipment by the Motor Wheel Corp. Great strength is claimed as one of the features of the new line and wheels are also lighter than those previously made.

With the present trend in the medium and higher priced automobile fields toward wide options on finish and equipment, the appearance of these new wheels is decidedly timely. They enable car manufacturers to complete the assembly of the cars minus the wheels, leaving the selection of these units until the last minute. They also enable dealers to interchange wheels on cars to suit the fancy of the buyer.

Interchangeability of the wheels is complete, except in so far as studs of different length are required to attach wheels of the various types. Another feature of the wheels is the standardizing of various dimensions. For instance, the roller bearings in all



Three types of interchangeable wheels—wire, disk and wood spoke. Return-bend, or U-flange, on outer edge of brake drum is not shown in these drawings

wheels have a spacing of 2 in. Wheel hubs are put out in four sizes. Where a 5-in. bolt circle is used there are five bolts; a 6-in. bolt circle calls for six bolts, and the same applies to 7 and 8-in. bolt circles. A similar graduation is made for wheel bore, the 6-in. bolt circle wheel having 4.5 in. bore, and others varying in proportion.

The disks of the disk wheels are formed from 0.145 in. stock. This dimension is retained at the hub, while at the rim the disk tapers down to 0.080 in. A single coining operation for the bolt hole bosses is used, in order not to set up strains in the metal at this point, a common point of failure of disk wheels. Near the outer end, where a hole for the tire valve had to be punched in the disk, the edges of this hole have been turned over for strengthening, thus eliminating the necessity for thicker stock at this point and facilitating the carrying out of the taper to the rim. Rims are pressed on and riveted. The rivets do not take any stress but take care of tolerances in manufacture of the wheel disks and rims.

Brake drums, which form integral parts of these wheels, are also considerably lighter than formerly. The inner edges of these drums have been turned up and back, providing a U-shaped flange at the edge, which has made it possible to reduce the stock thickness to ⅛ in. without reducing the rigidity of the drum.

The same idea of eliminating all unnecessary metal has been carried out also in the hubs. This is most noticeable in the hub sleeves for the front wheels, which appear unusually thin. Repeated tests have shown, however, that these sections have an ample factor of safety under all conditions.

Aside from the reduction in weight in the hubs, the designs do not depart materially from the conventional. The wheels are so designed that the hub bolts do not take any stresses but set up a clamping action between the wheel and the hub.

High carbon steel is used for the rims, which is another factor in reducing the weight, as the stock thickness is now 0.112 in., while formerly with low carbon steel it was 0.140 in.

The new line of wheels is being marketed in all standard sizes, from 18 to 21 in., and each wheel will carry three sizes of rim, 4, 4½ and 5 in.

New Automotive Products Among Chemical Exhibits

THE Eleventh Exposition of the Chemical Industries was held during the week of Sept. 26, in the Grand Central Palace, New York. A large variety of products of the chemical industries were shown, including some new ones, but the show seems to be developing more and more into one of equipment for the chemical industries. Three floors were occupied with exhibits, a prominent part being taken in the exhibition by various departments of the Government.

In one corner of the main floor there was a sort of educational exhibit sponsored by one of the professional organizations in the chemical industry. This contained what are evidently regarded as some of the latest developments in chemical technology. There were six items, and at least three of them are of direct interest to the automotive industry. The information was vouchsafed that synthetic methanol (wood alcohol) is now being produced in the United States by two distinct methods. It may be remembered that a ban was placed on the imports of such methanol about a year ago in order to protect the industry of hardwood distillation. One method of production constitutes one step in the purification of the gases used in the synthesis of ammonia. By the other process the methanol is made from gases formerly wasted in the fermentation process of butanol manufacture. The manufacturer is the Commercial Solvents Corp., Lazote, Del.

Another comparatively new chemical product to which attention was drawn is ethylene glycol, which is marketed by the Carbide and Carbon Chemicals Corp. as the base for an automobile non-freezing solution. It is an intermediate product between alcohol and glycerine.

Chromium plating, to which attention was drawn also, is of most direct interest to the automotive industry and probably finds by far its most important applications in this industry.

Various exhibits of an educational nature were shown also at the booth of the Westinghouse Electrical & Manufacturing Co. One of these was a power amplifier said to have an amplification ratio of 100,000,000 to 1. By approaching one's hand to a silvered bulb it was possible to light up a Knowles grid glow tube, and this in turn started a 1 hp. electric motor. When the hand was withdrawn the bulb became extinguished and the motor stopped. Another exhibit consisted of a polarized light device by means of which the stresses in mechanical models of celluloid could be studied. The models were of U-section with sharp corners, and by forcing the arms apart considerable stresses could be induced at the corners, which were reflected by the polarized light transmitted through the models, which appeared in colored bands on a screen. The Westinghouse company also exhibited an airplane propeller made of micarta.

A very large exhibit was made by the Bakelite Corporation. One of the latest applications of Bakelite in automobile construction is to the finger levers of the spark and throttle control, and it certainly adds to the attractiveness of the inside finish of closed cars.

Fire extinguishers making use of liquid carbon dioxide were shown by the Fyre-Freez Corporation, a subsidiary of the General Carbonic Company. The extinguishing medium in the Fyre Freez extinguisher is liquid carbonic acid stored in a steel bottle. The bottle is provided with a quick-opening valve, which when opened releases the whole content. When released from the container, the gas, owing to its rapid expansion and high heat capacity, instantly freezes into a dry carbonic snow, at a temperature of 110 deg. below zero. There is a dual extinguishing effect, viz., the smothering effect of the carbonic gas, the intense chilling effect of the carbonic snow, and there is the further advantage in that carbonic acid is an inert substance and does not spoil substances on which it may be thrown. It does not attack the rubber insulation of electric cables. It is said to be particularly effective on gasoline, motor oil, paint, varnish, lacquer and thinner fires.

A number of moving picture films illustrating industrial processes were shown in a lecture room.

New Developments— Automotive

LeBlond Crankshaft Lathe

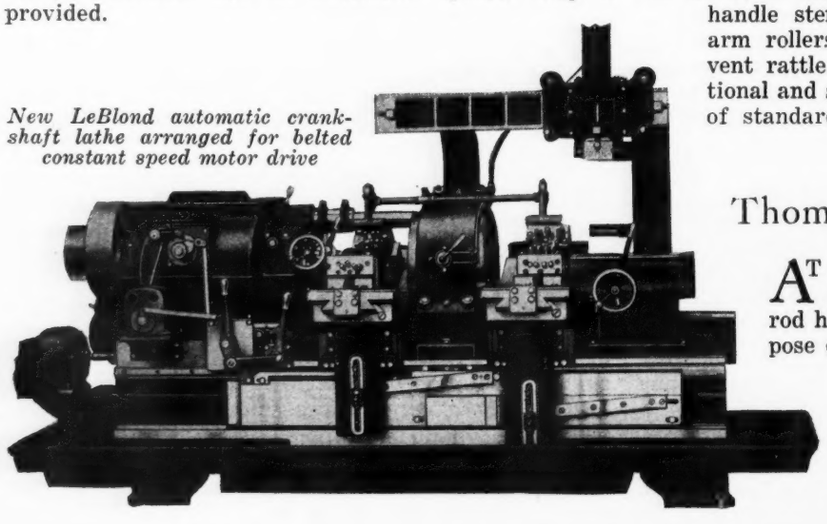
THE center drive automatic crankshaft lathe recently brought out by The R. K. LeBlond Machine Tool Co., Cincinnati, and described briefly in *Automotive Industries* of Oct. 1, is designed to machine the stub and flange end bearings of crankshafts or similar operations simultaneously in one set-up. Another feature of the machine is an overhead air-operated loading device added in order to simplify and expedite loading and unloading the machine.

The machine is provided with two front and two rear facing slides which feed toward the center of the machine. The crank is located in a center driving head from the previously machined center bearings and is supported on adjustable centers. Drive to the center head is through an overhead shaft and pinion from a large spiral face gear on the headstock spindle. The driving fixture revolves in two large diameter bronze ring bearings adequately lubricated.

The loading device is operated by a vertical air cylinder controlled by an air valve on the front of the machine and travels along an overhead guideway on hardened steel rollers. The machine is entirely automatic except for loading and engaging the feed lever.

Power is transmitted from a 10 to 20 hp. motor—depending upon the work to be performed—to the headstock through a single pulley containing a multiple disk friction clutch and brake. The spindle is driven through a helical gear. The headstock runs in oil which lubricates the clutch, spindle bearings and floods the gearing.

Feed to the facing slides is accomplished by means of hardened profile plates attached to the slide carriages. These plates are engaged by rollers which transmit the movement through rack and pinion to the facing tools. The plates are made so that after the tools are fed down to depth the slides continue to travel for a short distance with the rollers riding on the flat portion of the plates to size the diameters accurately without depending upon tripping mechanisms or clutch. The rapid power traverse is automatically controlled and an automatic spindle stop is provided.

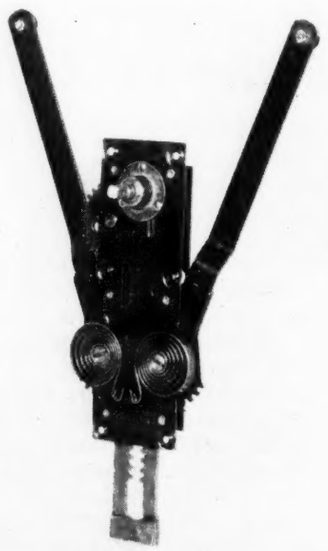


New LeBlond automatic crankshaft lathe arranged for belted constant speed motor drive

A submerged rotary pump supplies cutting compound to the tools and the flow of coolant is automatically controlled from the spindle. Either belt or gear drive is available. In the former model the motor is mounted on a plate attached to the base of the lathe while in gear drive machines the motor is mounted on top of the headstock. Only plain starters or controllers are required, as mechanical start, stop and brakes are supplied with the lathe.

Dura Window Regulator

THE Dura Co. has brought out a double-arm type of window regulator designed for use in buses and for operating large car windows. Glass travel up to 26 in. can be obtained by the use of different length arms.



New Dura double-arm window regulator

The design incorporates a floating rack construction which permits the gear sectors to overlap each other, thus making possible a maximum lift with minimum glass width. The teeth of the rack are stub type, affording smooth operation with great strength.

The back plate has six holes for mounting purposes, only four of which are ordinarily required. The regulator can be mounted on wood bars, angle irons, band iron straps or direct to metal panels. It is made with various handle stems to fit all standard handles. The arm rollers are standard Dura type which prevent rattle. Counterbalance springs are conventional and strong enough to lift double the weight of standard passenger car windows.

Thompson Eccentric Tie Rod

AT the Detroit plant of Thompson Products, Inc., the Thompson eccentric tie rod has recently been developed for the purpose of fitting into the design of new front axle assemblies with their brake drums, added unsprung weight and increased strains.

The distinguishing feature is a new style bearing into which the ball studs on either end fit. These bear-

Parts, Accessories and Production Tools

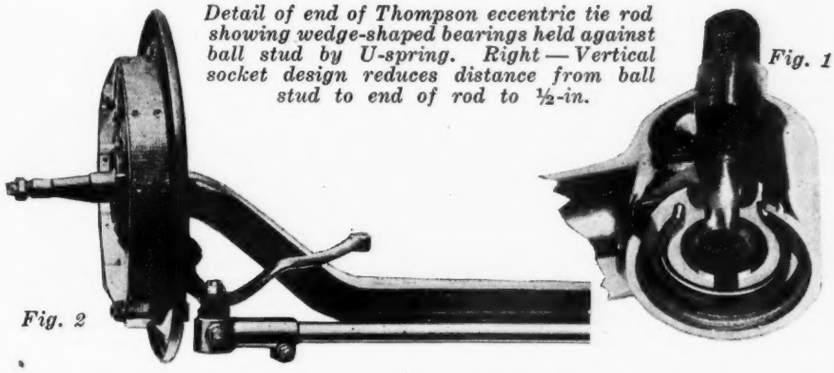


Fig. 2

Detail of end of Thompson eccentric tie rod showing wedge-shaped bearings held against ball stud by U-spring. Right — Vertical socket design reduces distance from ball stud to end of rod to ½-in.

Fig. 1

ings consist of two pieces which are concentric with the axis of the ball stud, as shown in Fig. 1, and which give a wedge shape to either half. Under pressure from a U-shaped spring shown, which is applied to the wider edges, the narrow edges of the wedges are closed in toward each other around the ball stud. This feature takes up any wear and keeps the ball and socket joints permanently in their close fitted condition, thus preventing any tendency toward shimmying caused by loose tie rod joints, rattles and pounding.

Another feature is small end clearance, the new tie rod with its vertical sockets measuring only ½ in. from the ball stud to the end of the rod. This clearance feature becomes still more important with the tendency to provide wider brake drums.

Since the rod is hung on to the steering arms and the shank of the ball stud passes through a hole in the socket smaller than the diameter of the ball stud the rod cannot fall from the balls. The eccentric universal joint principle and provision for lubrication give ease in steering. All working parts are sealed against grit and water. The tie rod is relatively light and aids in keeping unsprung weight down to a minimum. It is completely assembled at the factory to facilitate application in the assembly line of the motor car maker. Variations in detail design adapt the eccentric principle to all sizes and types of cars.

Atlas Valveless Aircraft Motor

THE Aircraft Holding Corp., Los Angeles, Cal., is producing a new type of radial air-cooled aircraft motor. The 120 hp. size known as the "Atlas" is a stationary radial having eight cylinders and weighs with its supercharger 260 lb. This size was decided on to provide a moderate-priced powerplant for an airplane which will carry three people, a small amount of luggage, four hours' fuel and have a ceiling of 16,000 ft.

Work is already in progress on the second size to be known as the "Ajax." This is a six-cylinder 80 hp. size for the popular European light plane types now in extensive use as instruction machines, flying club equipment and pleasure planes for private owners. Such types usually carry two people and have a gasoline consumption of from 14 to 20 miles per gallon.

These engines operate on the two stroke principle, each cylinder firing a power stroke to the propeller shaft every time the piston rises to the head of the cylinder. This makes a total of eight power strokes per revolution in the 120 hp. size as against half this number for a valve motor having the same number of cylinders and working on the four-stroke principle.

Due to the absence of valves and extensive cylinder head mechanisms the motor has a 15 per cent smaller overall diameter than an equivalent radial motor having valves. The entire absence of openings in the cylinder heads eliminates the possibility of oil escaping and covering the occupants of the plane. The cylinder head is machined integral with the barrel, the only openings being the spark plug holes.

Specifications on the "Atlas" are as follows: Bore, 4⅞ in.; effective stroke, 4¾ in.; full stroke, 6 in.; compression ratio, 5.2 to 1; r.p.m. 1250; weight 260 lb. Gasoline consumption averages .52 pints per horsepower hour. Oiling is by force feed from a triple outlet pump, one outlet forcing oil to the main and connecting rod bearings, another to a spray in the crank case while the third forces an oil spray into the supercharger, causing the incoming mixture to be saturated with oil before entering the cylinders. This eliminates the early practice of mixing oil with the gasoline for two-stroke motors which has been found to cause carburetor trouble on account of the heavy oil necessary for air cooled motors filling up the jets of the carburetor.

Rear view of Ajax 80 hp. radial aircraft motor, showing supercharger case, magneto, carburetor and pressure gage

New Apparatus Gages *Anti-Knock* Characteristics *of* Fuel

Consists of single-cylinder water-cooled engine fitted with Midgley bouncing pin device and is designed primarily for refiners distributing Ethyl gasoline.

AN apparatus for determining the anti-knock characteristics of different fuels has been developed and is being marketed by the Ethyl Gasoline Corp., 25 Broadway, New York. It comprises a single cylinder water-cooled engine with direct-connected generator, the engine being fitted with the Midgley bouncing pin device, and of a control panel and auxiliary equipment.

The engine is built up on a 1250-watt Delco lighting plant crankcase. A water-cooled cylinder and head are used, and water is circulated by a motor-driven centrifugal pump. A remote reading thermometer whose bulb is screwed into the jacket water outlet enables the operator to keep the water temperature constant. The compression pressure is high enough to give more than sufficient detonation on Ethyl gasoline to operate the bouncing pin.

The fuel feeding system consists of a special carburetor having main and compensating jets and giving substantially a constant air-fuel ratio over the entire throttle range. Attached to the carburetor is a three-way gasoline cock which may draw fuel from either of two constant-head overflow cups. The two fuels to be compared are fed from bottles inverted in large cups, the complete units forming constant level fuel containers of the chicken fountain type.

The rate of fuel flow from the fuel containers into the constant head overflow cups is controlled by needle valves. Sufficient fuel is allowed to flow to insure a slight overflow from the cups on the carburetor. The fuel is thus fed to the carburetor under a perfectly constant head. Suitable strainers are provided for the filtration of gasoline before it enters the carburetor.

The gasoline which overflows is caught in bottles which are duplicates of those which form the fuel containers and may be substituted for the latter when filled with overflow.

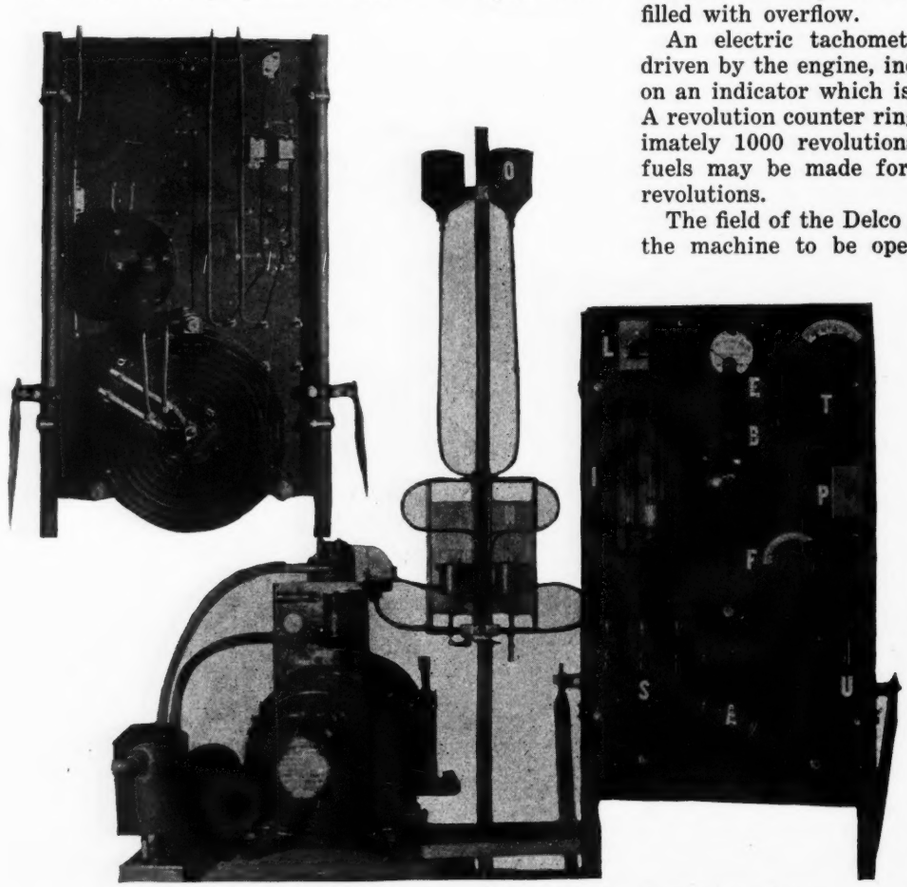
An electric tachometer, the magneto of which is driven by the engine, indicates the r.p.m. of the engine on an indicator which is mounted on the control panel. A revolution counter rings a bell at intervals of approximately 1000 revolutions, so that comparisons of two fuels may be made for exactly the same number of revolutions.

The field of the Delco generator is rewound to enable the machine to be operated at 1000 r.p.m. A field rheostat on the control panel provides for adjustment of speed to 1000 r.p.m. at any throttle opening.

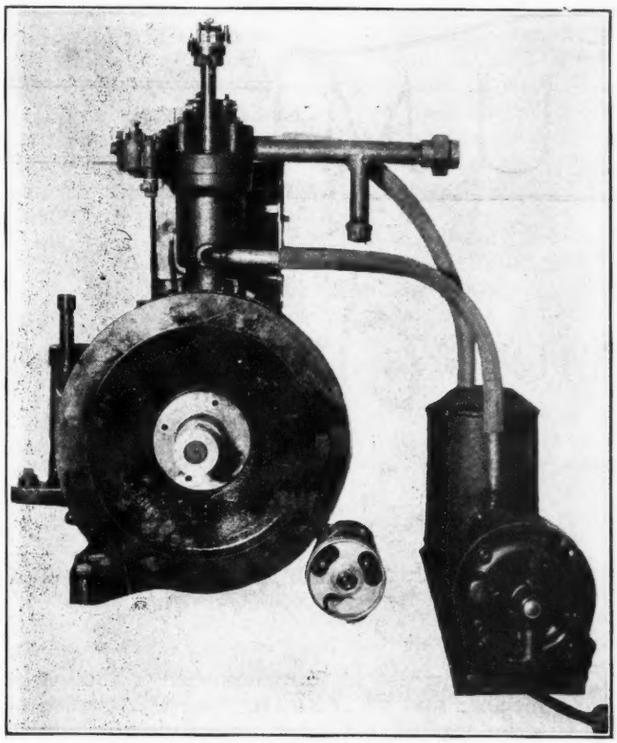
An armature resistor, mounted on the control panel, absorbs the current generated. A switch is provided so that the battery, furnished for starting purposes, may be charged at any rate from 0 to 35 amperes.

For comparing the knocking tendencies of fuels, the Midgley bouncing pin is provided. The pin element is screwed into a tapped hole provided in the cylinder and the electrolytic cell is mounted on the control panel.

The pin element consists of a cylinder containing a piston and spring element. The free pin, guided by the hollow spring shaft, rests on the top of the piston. The spring is so



Outfit for comparing anti-knock qualities of fuels. Rear view of control board is shown above



View of power unit with bouncing pin in place

designed that a normal explosion causes only a small deflection but an explosion accompanied by detonation causes the piston to project the pin upward, in which position it closes an electric circuit. When the contacts are closed, current flows through the lamp on the panel and through the electrolytic cell, causing the evolution of gas at a rate which is taken as a measure of the intensity of the knock.

The apparatus was designed chiefly to enable petroleum refiners to determine the proper proportion of lead tetraethyl to add to their motor fuels in order to bring the anti-knock value up to a certain figure, and the procedure generally is to compare the detonation of a trial sample with the detonation of a sample of standard ethyl gasoline.

The engine is adjusted to give a moderately heavy knock on standard Ethyl gasoline. The unknown sample is treated to some arbitrary concentration of lead tetraethyl as a first trial. Alternate runs are made on standard Ethyl gasoline and the treated unknown sample and the amount of gas evolved in the electrolytic cell due to the action of the bouncing pin is observed and recorded.

If the unknown sample knocks more, as indicated by a greater evolution of gas, another sample of the unknown gasoline is treated to a greater concentration of lead tetraethyl and the process repeated. This process is repeated until a concentration of lead tetraethyl is found which causes the unknown sample to evolve the same amount of gas as the standard Ethyl gasoline. Other portions of the unknown gasoline are then treated to a slightly greater and slightly lesser concentration of lead tetraethyl and compared with the standard Ethyl gasoline. These should evolve less and more gas respectively than the standard Ethyl gasoline.

Indiana Has New High-Speed Truck

THE Indiana Truck Corp., Marion, Ind., has brought out Model 638, a six-cylinder, 4 to 5-ton speed truck designed for heavy-duty, high-speed service of all kinds. It is powered with a 4 x 5 in. valve-in-head, six-cylinder motor which develops 78 hp. at 2000 r.p.m. Features of this engine are three-point suspension, full force feed lubrication, inclosed cylinder head, centrifugal pump water circulation and fin and tube type radiator.

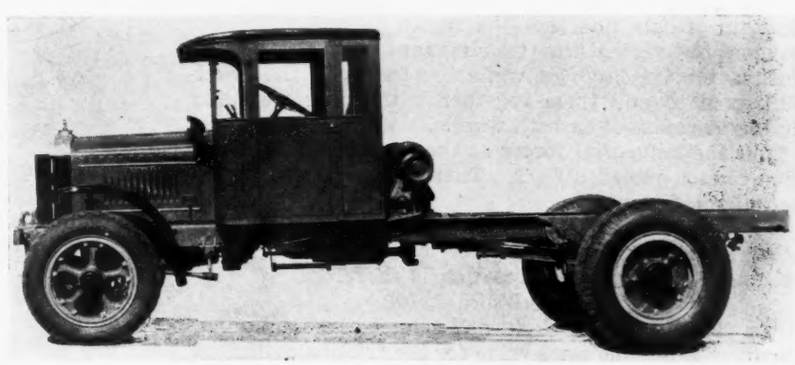
The plain type carburetor is provided with a hot spot. The clutch is a 13-plate dry type while the amidships transmission has two speed ranges providing seven speeds forward and two reverse, varying from .78 to 1 for fourth speed on the high range to 9.50 to 1 for first speed on the low range. Tubular propeller shafts are connected by fabric universal joints at the front end and metal joints at the rear.

The front axle has chrome nickel steel spindles 2 in. in diameter. Steering thrust is taken by ball bearings on top of the steering knuckle. The worm drive rear axle if full floating with the worm and differential mounted on roller bearings. Power is transmitted to the differential from heavy lugs cast on the worm wheel which fit over the ends of the differential spider.

Internal brakes on the rear wheels with 21 in. diameter drums and 3¾ in. bands are operated by either pedal or lever. Cam and lever steering gear in connection with a 20-in. wheel is employed. The pressed steel channel frame is 7 in. deep with 3 in. flanges and is made from 5/16-in. stock. Springs are silica manganese steel; 12 leaves 40 in. long and 2½ in. wide in front and 16 leaves, 50 in. long and 3½ in. wide in the rear. Metal wheels are fitted with solid tires, or optionally at extra cost, with pneumatics.

Standard gear ratio is 8¾ to 1. Speed is 20 m.p.h. with solids and 30 with pneumatics. Body allowance is 1650 lb., total maximum load is 12,000 lb., and the chassis weight is 8100 lb.

Standard equipment includes Boyce Moto Meter, front fenders, metal radiator guard, bumper, Prestolite headlights, tail light and tank, tow hooks front and rear, mileage recorder, air cleaner.



Indiana Model 638 six-cylinder truck chassis

THE FORUM

Six-Wheel Traction Conditions

Larger wheels will furnish propulsive effort up to limit set by ground adherence and will then begin to spin, whereupon smaller wheels will take up work.

Editor, AUTOMOTIVE INDUSTRIES:

Referring to the article on "The Case for a Differential Between Axles in a Six-Wheeler," in your issue of August 13, the assertion made by Mr. Heldt that where no differential is used between axles and the average diameter of the wheels on one axle is greater than that of the wheels on the other, all of the useful propelling effort comes from the wheels of larger diameter, is true only up to a certain point.

In this analysis, to simplify matters, let us assume that:

1. Driving and propeller torques are taken in such a manner as to leave equal loads on both wheels.
2. All parts are without give (rigid tires) and that angular motions are equal.
3. The larger tires are a 100 per cent larger in diameter than the smaller ones.
4. The slight angle which a line joining the axles makes with the ground may be neglected.

Instead of bothering with gears, let us insure equal angular motion by means of a link or side (see sketch) which connects with the smaller wheel at the point of contact with the ground and with the larger wheel at a point at a distance R from the axis, equal to the radius of the smaller wheel. By this means we can simplify the problem and eliminate the necessity of considering torque on the rear axle.

If we now apply a torque PA, in the direction shown, to the larger wheels, by means of two equal but opposite forces PA/R acting at the center of the wheel and at a radius R, we find that the forces balance when the tangential forces at the tire rims tend to separate them with a force $PA100/Ra$ while the forces in the lower link tend to pull them together with the same force acting at radius R on both wheels.

But the tangential forces at the tire rim due to friction cannot exceed $uWp/2$. There will therefore be no actual rotation until

$$100PA/Ra = uWp/2,$$

at which time either wheel tire is liable to slip. The torque required to start rotation is therefore

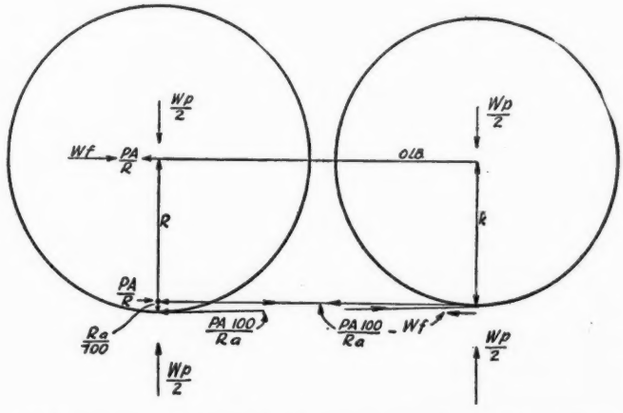
$$PA = uWpRa/2x100.$$

Since the slip will be slight and cannot cause spinning, we may assume the same value for the friction coefficient u as for no slip.

If we now increase the torque applied to the wheel, and remember that we cannot increase the traction at the tire rim, we find that forces are balanced by adding at the wheel center a force Wf opposing motion, at the same time decreasing the tension in the lower link by the same amount and, likewise, the opposing force between the smaller wheel and the ground.

It will thus be seen that we have obtained a useful traction force Wf not by increasing the traction at the rim of the larger tire but by decreasing the resisting force at the rim of the smaller tire.

When the traction force Wf reaches the value $100PA/Ra$ or $uWp/2$, which is required to slip a pair of wheels, it will be found that the lower link is without stress and the smaller diameter tire is neither opposing or aiding motion. Up to this stage, all useful traction (better called propelling effort) has come from the wheel of largest diameter.



If the torque is still further increased, the lower link takes a compression force instead of a tension force as before and the force between the smaller tire and ground begins to be a useful propelling force instead of an opposing force. In other words, the larger tire is no longer furnishing all the useful propelling force.

The limit to which the torque can be increased is reached when the useful propelling force at the smaller tires is equal to that at the larger tires and the sum of

the two is equal to $2x100PA/Ra$ or uWp, at which time all drivers will start slipping.

Since the larger wheel travels the same distance as the smaller, it is evident that it slips for each revolution a distance equal to the difference between their circumference or $a \times 2R \times 3.1416$, and this slippage occurs under a load of $uWp/2$, hence the energy lost per revolution is $0.031416aRuWp$ and is independent of the propelling effort f. In other words, it is a constant drag and not a fixed percentage of the total.

When, instead of rigid tires, we use rubber tires with considerable elasticity, it is evident that that portion of the tire which transmits the torque or traction stress must stretch a certain amount before it can do so. It is also evident that this stretching must occur between times that any given point on the tire is in contact with the ground. If we assume a difference of 1 per cent in tire diameters, the maximum stretch due to this difference is 1 per cent of the length of tire-ground contact. The flexibility of the tire will determine the stress as a result of this stretch and certainly make it far less than with rigid tires, even if it does not reduce it to a negligible amount.

Any traction between tire and ground is transmitted to the rim of the wheel along lines that run from points of contact approximately tangent to the rim or, if anything, to a circle of smaller diameter than the rim. This, together with the fact that the part of the total traction assumed by any given spot on the tread, increases from nothing at the first point of contact with the ground to a maximum slightly before contact is lost, means that the resultant force therefore tends to decrease the effective radius of the tire somewhat in proportion to the torque transmitted through the tire, thus automatically decreasing the effective difference between the diameters.

M. R. WELLS.

In non-mathematical language, the results of Mr. Wells' analysis may be expressed by saying that the larger wheels will furnish all the propulsive effort up to the limit set by their ground adherence; if the propulsive effort required to move the vehicle is greater, these wheels will slip in proportion to the difference in tire diameters and the excess propulsive effort will then be furnished by the smaller wheels. The propulsive effort can be increased until these wheels also reach the limit set by their ground adherence, whereupon all four wheels will spin.—EDITOR.

Landing Method for Aircraft

Editor, AUTOMOTIVE INDUSTRIES:

Please allow me a few words with reference to an article in your issue of Aug. 6, page 190, on a landing method for aircraft.

Several years ago I conceived the idea of landing in an artificial air current, and an application for a U. S. patent has been made on this apparatus. Only recently I was advised that my claims covering the method had been allowed and that the patent might be issued any time. I should also like to call your attention to the description of my device in "Popular Science" for Aug. 1927, page 43, where, however, a mistake was made by the draftsman in placing the wind device at the front instead of at the stern of the ship. It is evident that the speed of the ship at sea must be taken advantage of to reduce the relative landing speed of the airplane against the platform, in addition to the similar action of the air current.

I am rather surprised at the statement of Capt. Leininger that the artificial air current would make it possible to take off at a steeper angle. Inasmuch as the relative air speed changes as soon as the plane gets out of the artificial air current, the machine would get into a stall and a more or less serious fall would result.

F. BRUNNER.

Diesel Speed Possibilities

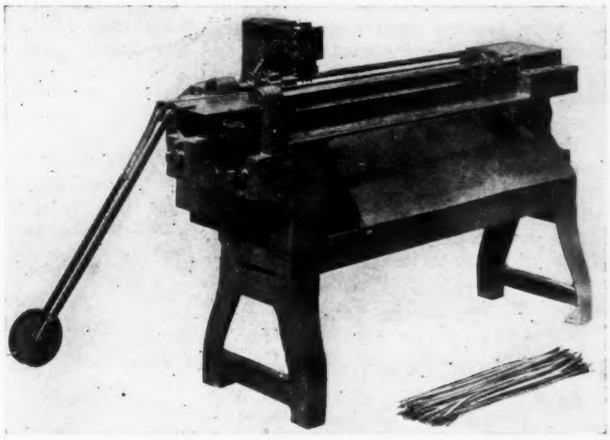
Editor, AUTOMOTIVE INDUSTRIES:

In addition to the data on which my recent communication on automotive Diesel engines is founded, I have just come across the following figures regarding the motorcycle Diesel brought out by Dr. Frey. This engine develops 6 hp. at 2400 r.p.m. and the fuel consumption then is 0.55 lb. per hp.-hr. The bore is 80 mm. the stroke 90 mm. If these figures are authentic, they certainly are a striking refutation of Mr. Matthews' pessimism with regard to the possibilities of the high-speed Diesel. The data are taken from the Czecho-Slovakian Journal *Motor*, No. 16, 1927, page 927. The same article also gives the fuel consumption of the Maybach air injection Diesel as 0.41 lb. per hp.-hr. at 1300 r.p.m. This motor develops 110 to 120 hp.

C. A. NORMAN.

Wire-Cutting and Stripping

THE Artos Engineering Co. of Milwaukee, Wis., has developed a new type of machine which automatically measures wire into lengths, cuts them off and simultaneously strips the insulation from both ends. The machine is adjustable both with regard to the cutting length, stripping length and size of wire. The capacity of the machine is 3600 pieces cut and stripped per minute.



Artos wire cutting and stripping machine

THREE German chemists, Tacke, Noddack and Berg, have discovered a new element, rhenium, of an atomic weight of 75, which they isolated from gladolinite, in the proportion of one milligram of oxide to 10 kilograms of the base material. This metal forms a white oxide which volatilizes toward 300 deg. C. The sulphate is gray and insoluble in ammonia sulphate. The chlorate and alkaline compounds of the metal are colorless. The presence of this metal in other minerals containing tungsten has also been established. After the discovery of element 61 last year and the discovery here referred to there remain only two gaps in the periodic system which will have still to be filled.

AUTOMOTIVE NEWS SECTION INDUSTRIES

Philadelphia, Pennsylvania

Saturday, October 15, 1927

Factory Production Lower as Sales Continue Decline

PHILADELPHIA, Oct. 15—A continuation of the downward trend of recent weeks in automobile production and sales is currently observed. Whether the decline is more than normal for the season depends somewhat on the point of view, as several of the producers are still well above last year's level.

In September the group of producers exclusive of Ford turned out about 273,000 vehicles, approximately equal to the same months of 1926. As a group, therefore, they held their own, but the entire industry, including Ford, in September last year produced 410,000 cars and trucks. Thus, for the first time this year, the production deficit caused by Ford's inactivity was not made up in part by the other companies.

The heavy production of most of the factories during the summer months, after new models were brought out, was well absorbed but the rush of buying was not long maintained and conditions are now rather quiet. Although this is credited in large part to the disposition to await the Ford announcement, difficulty in moving used cars is causing many dealers to concentrate on this end of their business as they have found too much of their capital tied up in the second-hand vehicles.

Production economies and lower raw material prices have helped automobile makers to maintain profit margins where volume has been good despite price cuts this year. *Automotive Industries'* automotive raw material price index for September showed another slight decline at 121 against 122 for August.

Moreland Not in Merger

LOS ANGELES, Oct. 12—Watt Moreland, president of Moreland Truck Co., emphatically denies reports that negotiations are nearing completion for merger of the Moreland, Fageol and Kleiber companies. Mr. Moreland says such consolidation has been suggested as a means of solving keen competition in this territory, but as far as Moreland company is concerned there will be no merger.

Buys Truck Engineering

CLEVELAND, Oct. 12—American Coach & Body Co. has taken over the Truck Engineering Co. which has done business in Cleveland for 10 years. The Truck company, manufacturer of hydraulic hoists, cabs, winches, and tanks for trucks, will hereafter be known as a division of American Coach. James Holan is president of the combination. The present personnel of the Truck company will be retained.

G.M. Sales Totals Exceed 1926 Marks

NEW YORK Oct. 14—Retail sales by General Motors Corp. dealers in September totaled 132,596 as against 158,619 in August and 118,224 in September last year. Sales by divisions to dealers totaled 140,607 as against 155,604 in August, and 138,360 in September, 1926.

Comparisons follow:

Dealers Sales to Users

	1927	1926
Jan.	81,010	53,698
Feb.	102,025	64,971
Mar.	146,275	106,051
Quarter total	329,310	224,720
Apr.	180,106	136,643
May	171,364	141,651
June	159,701	117,176
Quarter total	511,171	395,470
July	134,749	101,576
Aug.	158,619	122,305
Sept.	132,596	118,224
Quarter total	425,964	342,105
Total quarters	1,266,445	962,295

Divisions Sales to Dealers

	1927	1926
Jan.	99,367	76,332
Feb.	124,426	91,313
Mar.	161,910	113,341
Quarter total	385,703	280,986
Apr.	169,067	122,742
May	173,182	120,979
June	155,525	111,380
Quarter total	497,774	355,101
July	136,909	87,643
Aug.	155,604	134,231
Sept.	140,607	138,360
Quarter total	433,120	360,234
Total quarters	1,316,597	996,321

Avery Joins Murray

DETROIT, Oct. 12—C. W. Avery has resigned as chief development engineer of Ford Motor Co. to become assistant to the president of the Murray Corp. of America. Mr. Avery takes over his new duties immediately and these will connect him with the various Murray affiliated companies, J. W. Murray Mfg. Co., Dietrich, Inc., and Jenks & Muir Mfg. Co.

German Maker Buys Rickenbacker Rights

DETROIT, Oct. 12—J. S. Rasmussen, owner of the Zschopauer Motor Works, Germany, has purchased from the receiver the right to manufacture Rickenbacker engines in all countries of the world except the United States and Canada. He has also acquired all tools, jigs, dies and fixtures and drawings of the complete car. By the arrangement, all service parts for overseas sale in the future will be manufactured by him. The real estate and remaining personal property will be offered at auction Nov. 28. This includes service rights in the United States and Canada.

Falcon Expands Factory for 35,000 Output in 1928

DETROIT, Oct. 12—Falcon Motors Corp. is expanding its plant at Elyria, Ohio, to produce 35,000 cars in 1928. Additional machinery is being installed without interrupting present production. During the six months from April 1, when the first Falcon-Knight was produced, until Sept. 30, the company shipped approximately 10,000 cars. During that period, the dealer organization expanded and retail sales have shown a consistent gain. It is declared that the increased output will be absorbed readily. Executive offices of Falcon Motors Corp. have been moved to 2406 Eaton Tower.

Oakland Output Gains 37%

PONTIAC, Oct. 10—Oakland Motor Car Co. production for September totaled 22,079 units, a gain of 5945 or 37 per cent over the same month in 1926, according to W. R. Tracy, vice-president in charge of sales. Sales for the first nine months totaled 156,258 units compared with 111,821 for the corresponding months last year.

No Machine Tool Show in 1928

LENOX, MASS., Oct. 11—The National Machine Tool Builders Association voted today not to hold a show next year. J. E. Andress of Barnes Drill Co., H. E. D. Gray, Landis Tool Co., and Howard Dunbar, Norton Co., were elected new directors. New officers elected are P. E. Bliss, Warner & Swasey, president; H. K. Spencer, Blanchard Machine Co., first vice-president; Henry Buker, Brown & Sharpe, second vice-president; E. A. Muller, King Machine Tool Co., treasurer.

New Ford Arrival Now Matter of Days

Statement That Final Assembly Operations Are Ready Indicates Proximity

PHILADELPHIA, Oct. 14—Formal announcement of the new Ford car and its actual appearance in the showrooms of dealers is expected now to be only a matter of days. Though no direct statement to this effect has been issued by the company, its publicity release this week indicates that it is now set for final assembly operations and that dealers will have display cars within a short time.

Henry Ford, in Baltimore this week, attending the centennial exhibition of the Baltimore and Ohio Railroad, was on his first holiday since work on the new car got under way early this year. Mr. Ford is credited with supervising personally practically all of the new car work. The fact that he is relaxing to the extent of looking over a display of old railroad and transportation equipment is taken to indicate that most of the problems of getting the new car out have been solved.

When asked at Baltimore about the new car he is quoted as saying:

"I am tired of fussing about the new car."

The publicity release of the week indicated that 125,000 persons have placed advance orders with deposits and that 250,000 others have placed orders without cash. Manufacturing plants have been turning out major parts of the new car for several weeks and the first assembly of new bodies began several days ago, the statement said.

With the assembly line moved to the Fordson plant capacity has been doubled, and the Highland Park plant has been converted for the manufacture of body parts and other parts exclusively. According to the statement, further, officials estimate that nearly one-third of the plant operations will be devoted to the manufacture of replacement parts for the Model T.

Ford production executives estimate that more men will be required in the new production operation than were required formerly, but that the amount of manual labor per car will be reduced, the statement said.

Rubber Development Plan Confirmed by Company

DETROIT, Oct. 12—Plans for large scale rubber production in Para, Brazil, by Ford Motor Co. were announced today by Edsel Ford, the announcement confirming reports of this activity published recently by *Automotive Industries*, and giving further indication of company plans for large scale tire production in its Highland Park plant.

The development will be conducted by the Ford Industrial Expansion Co., which is made up of Henry and Edsel Ford and other persons prominent in the Ford organization. Capitalization is for $1,000,000. The company has a rubber concession of 4,000,000 acres on the Tapajos River, a condition of the grant requiring a specified amount of acreage be planted to rubber each year.

The company plans immediate placing of settlements and a widespread sanitary campaign. Boats of the Ford company will be in communication with the property and airplane communication with Detroit may be established later.

Ayres Sees New Car General Trade Help

CLEVELAND, Oct. 12—The role of Ford in shaping the automotive industry throughout the world was given the lead in the Cleveland Trust Co. business bulletin for October, edited by Col. Leonard P. Ayres.

"The most important business development of the past month is one that has not been reflected in the current statistics of industry or trade. It is destined nevertheless to play a most influential part in shaping the course of business activity during the coming months and next year. It is the presentation of the new Ford car."

This was the lead in Col. Ayres' widely-read barometer of business in the United States. Excerpts from his diagnosis of the automotive situation follow.

"A step without precedent in the industry was taken in the industry last May when the plants closed down and development of the new model was started—something like what might happen if the United States Steel Corp. should suspend operations for six months, although not so serious.

"Thousands of orders have been placed for the new models and Middle West manufacturing industry will soon feel the stimulus of this new business, and railroad traffic and wholesale and retail trade will be affected by it."

National Air Conference Called by MacCracken

WASHINGTON, Oct. 11—A national conference, for the primary purpose of aiding aviation, was called this week by William P. MacCracken, Jr., assistant secretary of commerce for aviation. The conference will convene here in December, lasting five days.

There will be five main topics relating to air commerce regulations, aviation schools, airports, their rating, regulation, etc., testing of aircrafts, motors and accessories, and airway lighting and weather reporting.

Buick Sales Gain 12,000

FLINT, Oct. 10—Since the introduction of the present Buick models in July, all sales records have been broken, according to C. W. Churchill, sales manager of Buick Motor Co. Sales for July, August and September aggregate 82,955 compared with 70,941 for the corresponding period last year.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co.*

NEW YORK, Oct. 15—Unseasonably warm weather during the past week has retarded the rate of distribution of goods at wholesale and retail, though trade in certain lines is somewhat larger than a year ago. Basic industries are considerably less active than in the corresponding period of 1926, though the credit facilities of the country show no signs of contracting at the present time. Of particular interest last week was the huge total of security loans, aggregating nearly four billion dollars, reported by the New York Stock Exchange. Daily production of pig iron for September was 11.5 per cent lower than a year ago, while business failures for the month were 13.4 per cent ahead of last year.

FREIGHT CAR LOADINGS

Railroad freight car loadings in the week ended Sept. 24 numbered 1,125,868, as compared with 1,127,613 in the previous week and 1,175,407 in the like period a year ago. Total loadings so far this year amount to 38,871,504 cars, as against 39,134,140 cars in the corresponding period last year and 37,892,944 cars two years ago.

BUILDING CONTRACTS

September construction contracts, as reported by the F. W. Dodge Corp. for 37 states east of the Rocky Mountains, were 6 per cent lower than in August and 7 per cent below the like period a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices was unchanged last week at 145.5, as against 144.4 four weeks earlier.

BANK DEBITS

Bank debits to individual accounts, as reported to the Federal Reserve Board for the week ended Oct. 5, were 20.9 per cent above the total of the preceding week and 16.5 per cent above the amount reported in the corresponding period of 1926.

FEDERAL RESERVE REPORT

For the same period the Federal Reserve banks reported that discounts rose $32,200,000, open market purchases $20,000,000, U. S. government securities $10,500,000, note circulation $11,300,000, deposits $36,600,000. Member banks for this period reported that discounts increased $149,944,000, investments $13,517,000, demand deposits $188,180,000, borrowings $41,426,000.

Time money and commercial paper rates were irregular at 4 to 4⅜ and 3¾ to 4¼ per cent, respectively.

American Grinder Sold

CHICAGO, Oct. 8—Blackhawk Mfg. Co. of Milwaukee, has sold to the Milwaukee Circulating Pump & Mfg. Co. the line of American grinders.

Stock Car Races Out Pending New Rules

A.A.A. Declines Further Sanctions Until Regulations Are Revised and Approved

WASHINGTON, Oct. 12—No further sanctions for stock car racing in 1927 will be given by the contest board of the American Automobile Association, this action being taken pending the formulation of a more complete and detailed set of rules which will effectively cover all phases of this competition and which can have the approval and support of the National Automobile Chamber of Commerce.

In a statement covering this action, Val Haresnape, secretary of the contest board said:

"The industry as a whole has given warm support in our efforts in assuring that all cars competing in sanctioned stock car races were exactly as coming through regular production and as on national sale to the buying public. Likewise our insistence that all advertising conform with the exact facts has been to a high degree supported. However, recent developments warn us that this strict adherence to the policies originally undertaken is becoming increasingly difficult to obtain.

"At the outset we pledged both the industry and the public in an official announcement, that in so far as it was possible for us to humanly insure, stock car racing and its resulting exploitation would be free from taint of trickery and that when we felt that this assurance could not be given honestly we would at once retire from the sponsoring of any further contests. It is in keeping with this pledge that we prefer at this time to withdraw from any further supervision or certification of stock car racing until there can be more uniform accord, first as to what constitutes a stock car, and second, who in the final analysis shall be judge as to whether or not the regulations are being conformed with."

British Air Secretary to Inspect Plants Here

WASHINGTON, Oct. 10—An inspection of aircraft establishments in this country will be made by Sir Philip A. G. D. Sassoon, secretary of state for air for Great Britain, who will arrive in New York this week on the Mauretania, the War Department announces.

The course of his tour as announced by the department, is as follows: Wright Aeronautical Corp., Curtiss Aeroplane & Motor Co., Inc., Naval Air Station at Hampton Roads, Va., Langley Field, Va., Wright Field, Dayton; Ford Airport and Airship Development Co., Detroit, and the Glenn Martin Aircraft Corp., Cleveland. The major portion of his trip will be via air in War Department planes.

10,000 Boys Build Studebaker Models

SOUTH BEND, Oct. 10—The 12 national winners in the Studebaker boys' model contest were announced this week by the Studebaker Corp. of America. The contest, one of the most unusual ever held by an automotive manufacturer, provided prizes for 108 boys who made the best models of a Studebaker dictator sedan. More than 10,000 boys offered samples of their skill, the modeling material including soap and plaster of paris.

1927 Exports Reach New Record Height

WASHINGTON, Oct. 12—All preceding automotive exports from the United States were broken during the January-August period of this year when the total exports reached an aggregate of $287,696,339, the U. S. Bureau of Foreign and Domestic Commerce announces. This represents an increase of $56,000,000 or 24 per cent over the export values for the corresponding period of the recent year of 1926.

Passenger exports showed a steady increase during 1927, the total for the eight months' period being 202,473 units. Total truck exports the first eight months this year were 72,719 units. In August, 1926, the ratio of exports to production was 4.2 per cent for passenger cars and 9.9 per cent for trucks and buses. In August of this year the ratio was 8.6 per cent for passenger cars and 27.6 per cent for trucks and buses. By way of comparison, England in 1926 exported 16.7 per cent, France 30 per cent, Italy 53 per cent, and Germany 3 per cent.

Nash Adds Three Models

KENOSHA, Oct. 10—Three new models are announced by Nash Motors Co.: A Special Six four-door coupe at $1,445; a Special Six four-passenger Victoria at $1,295, and a standard Six convertible cabriolet at $995. With addition of these cars, the Nash line now embraces 24 models, all sixes, and ranging in price from $865 to $1,990.

G. M. Show Draws Crowds

DETROIT, Oct. 10—The second annual fall showing of General Motors cars, in the General Motors Building, which closed Saturday, after a week's run, was declared by executives of the corporation to have filled the highest expectations. Large crowds visited the building each day and night and new attendance records are believed to have been set. Dealers handling General Motors cars within a 50-mile radius of Detroit staged individual displays.

Market Development Cheers A.E.A. Board

Directors Congratulate Moock and Urge Members to Support Department

CHICAGO, Oct. 8—At a meeting of the board of directors of the Automotive Equipment Association Sept. 30 and Oct. 1, a complete report of the activities of the A. E. A. Greater Market Development, from its organization to date, was made by Harry G. Moock, managing director. Following the report a resolution congratulating the department was adopted and ordered sent to all A. E. A. members:

"After a complete report on every phase of the A. E. A. Greater Market Development activity by managing director, Harry G. Moock, and a complete review of the department and its activities, the board of directors endorsed and congratulated the department on its accomplishments.

"The board feels that unusual progress has been made and that the definite results already accomplished are remarkable.

"The board believes there will be unanimous concurrence in its feeling, when the entire membership has heard this report.

"The directors hereby formally approve the action of the Greater Market Development committee to date and earnestly urge every A. E. A. member to support the department."

A. E. A. Plans Christmas Campaign

CHICAGO, Oct. 10—Departing from its policy of former years, the Automotive Equipment Association is not offering supplies for trimming Christmas windows this year. Instead it is advocating the use of certain merchandising ideas designed to move a maximum of stock already on dealers' shelves, at a minimum of cost.

Oakland Launches Work on New $3,000,000 Unit

PONTIAC, Oct. 10—Work was started today on a new $3,000,000 assembly plant for the Oakland All-American Six. The building will be two stories of the monitor type and will cover an area 540 x 640 ft. The structure will contain two assembly lines each a quarter of a mile long with a normal production capacity of 500 units a day. According to H. R. Boyer, works engineer, the two lines will raise the capacity to 720 units a day.

The Oakland engine and sheet metal departments will continue to manufacture in the present engine and sheet metal buildings and the old assembly building will be remodeled to provide additional office space and an auditorium.

Boeing Had Packard Engine

PHILADELPHIA, Oct. 12—In the story of the National Air Races it was stated that the Boeing FB-5 was powered with a Pratt & Whitney 550 hp. engine. This was an error. The engine used was a Packard 1500.

Wayne County Sales Show 33% Decrease

22 New Ford Model T's Sold in September—Commercial Sales Decline

DETROIT, Oct. 8—Passenger car sales in Wayne county in September aggregated 3945 according to figures prepared by the Detroit Automobile Dealers Association, bringing sales for the first nine months of the year to 45,850 compared with 66,798 for the same period last year. New Ford Model T's registered in September totaled only 22 bringing Ford sales for the first nine months to 3369 compared with 19,009 for the same period a year ago.

A total of 372 commercial vehicles were sold during the month bringing sales in this classification to 4215 for the first nine months compared with 7188 a year ago. A total of 11 tractors were sold making 60 for the first nine months compared with 100 a year ago.

Cincinnati Sales Off 275

CINCINNATI, Oct. 10—A sharp movement upward during the last 10 days in September brought automobile registrations for the month to 1235 compared with 1510 in September, 1926, a decrease of 275. Despite the fact that the decrease as between the two years was greater than shown in August, dealers were gratified at the showing.

In the face of the decrease in new car sales, the month showed a pick-up in used car registrations. The total for the month was 4185 as compared with 3788 in September, 1926, an increase of 397. The month's total, however, lacked 80 of reaching used car sales in August. New car sales during September were 245 less than the August total.

There is some complaint along automobile row regarding conditions and while the pick-up during the latter days in September apparently is continuing, sales are not up to expectations and do not compare with those of the first few days in October last year.

N.C. Sales Decrease 3150

RALEIGH, N. C., Oct. 10—Car sales in North Carolina during the first eight months of the current year totaled 40,609, a decrease of 3150 from the figures for the corresponding period of last year, according to figures compiled by the state department of revenue. The decrease is attributed to the slow down in Ford sales while the new model is being prepared for the market.

Oklahoma to Register 500,000

OKLAHOMA CITY, Oct. 8—Automobile registration for Oklahoma for 1927 will pass the 500,000 mark, officials estimated. Total registration to date for 1927 includes 460,000 cars, trucks and motorcycles. The gross revenue receipts from these cars amounts to over $5,000,000.

Federal Aid Roads Cover 75,600 Miles

WASHINGTON, Oct. 10—A total of 75,600 miles of Federal Aid highways has been either completed or is now under construction since the inception of the Federal Aid Highway program in 1917, according to progress report announced this week by the U. S. Bureau of Public Roads. The total cost was $1,522,661,467. The figures are up to Aug. 31, this year.

Between 1917 and July 1, this year, the total construction was 60,957, at a cost of $1,154,470,601, of which the Federal government paid $510,000,000. Since June 30 a total of 812 miles was completed. There are 13,831 miles under construction and 2249 miles have been approved for construction for which there is now $57,755,892 of Federal Aid funds available.

G.M. of Canada Begins Work in New Truck Unit

DETROIT, Oct. 10—General Motors of Canada, Ltd., has completed its new truck factory at Oshawa and to celebrate the opening, R. S. McLaughlin, president of the Canadian company, drove the first General Motors truck off the production line. The truck plant is the first unit in the Canadian company's $2,500,000 expansion program. According to Mr. McLaughlin, completion of the program will nearly double the company's output.

Other buildings which are now in the course of construction are a large metal-stamping mill, a four-story fireproof office building and a new paint shop. Additions are also being made to the body-building units, the assembly and radiator plants and the machine shops.

Defer Moving Yellow Truck Unit

MOLINE, Oct. 8—Paul W. Seiler, president and general manager of Yellow Truck & Coach Mfg. Co., has notified Earl A. Taylor, works manager of the Yellow Sleeve Valve Engine Works, Inc., that the local plant of Yellow Truck will not be moved to Pontiac this January as was originally planned. The plant is expected to continue in operation here for the next year until preparations are completed in Pontiac for the consolidation.

Threadnut Factory Moved

PHILADELPHIA, Oct. 12—Automatic Nut-Thread Corp., Buffalo, has taken over a four-story factory here which it will occupy about Nov. 1, manufacturing Threadnut automatic nut tapping machines.

Rim Output Shows Small Balloon Gains

Production for September of All Sizes Shows Decline From 1926 Total

CLEVELAND, Oct. 8—Production decrease in 1927 as against 1926 was continued in September, the rim inspection report of the Tire & Rim Association of America, Inc., shows. A total of 1,727,122 for September, 1927, compares with 2,365,518 in September, 1926. For the first nine months of 1927, inspections totaled 16,654,121 as against 20,054,273 in the same period last year.

Comparisons on leading sizes are:

			Sept. 1927	Sept. 1926
Clinchers		30 x 3½	124,775	183,859
Balloons	18"	26 x 4	57,212	18,996
"	19"	26 x 3½	33,362	9,235
"	19"	27 x 4	114,152	243
"	19"	28 x 4½	30,459	25
"	20"	27 x 3½	59,428	....
"	20"	28 x 4	306,150	270,834
"	20"	29 x 4½	47,156	19,337
"	20"	30 x 5	40,081	23,745
"	21"	28 x 3½	427,913	1,023,683
"	21"	29 x 4	96,427	240,693
"	21"	30 x 4½	101,275	231,519
Truck	20"	30 x 5	151,440	117,464

Inspection of high pressure rims took an upturn in September compared with August, but was still behind September, 1926. There were 57,328 rims of this type inspected, as against 88,028 in September, 1926, and 38,267 in August this year. Balloon rims in the 18 in. and 19 in. continue to show large gains, the 18-in. group totaling 68,332 against 23,225 for the same 1926 period, and in the 19-in. group 178,008, compared with 9503 in 1926. The substantial gain on the first nine months in 1927 against 1926 is therefore upheld. Declines in 20-in., 21-in., and 22-in. were continued.

Young Radiator Company Operating in New Plant

RACINE, Oct. 12—Young Radiator Co. is now in regular production and is shipping equipment daily to the bus, truck and industrial field. The work of getting into production was facilitated through the activity of F. M. Young, president, who spent nine months previous to the announcement of the company, designing tools, dies and machinery. The force of mechanics employed by the company was recruited from men who previously had worked for Mr. Young in the radiator field.

Auto Accessories Formed

CHICAGO, Oct. 12—Auto Accessories Corp. of America has been formed here through a merger of the Packer Auto Specialty Co., Standard Motor Parts Co., Geo. H. Rives Mfg. Co., and the Auburn Mfg. Co. P. Q. Wray is president of the new company.

Men of the Industry and What They Are Doing

Hal T. Boulden is Named Pierce-Arrow Truck Chief

Hal T. Boulden has been appointed manager of the truck division of Pierce-Arrow Motor Car Co. to head an important expansion program which the company is undertaking. In accepting the position, Mr. Boulden will return to a field in which for many years he was widely known.

For eight years Mr. Boulden was vice-president in charge of sales, service and advertising of the Selden Truck Corp., during which time he was also active in association work pertaining to promotion of truck interests. He was president and one of the founders of the National Association of Motor Truck Sales Managers which later was merged with the present Motor Truck Industries.

For the past three years Mr. Boulden has been president of the Boulden-Whittaker Co., Inc., of New York, which specialized in automotive advertising.

Making the announcement, G. C. Hubbs, assistant to the president in charge of sales, said the appointment of a man of Mr. Boulden's experience to head its truck division gives proof of the aggressive plans which Pierce-Arrow is contemplating.

Hal T. Boulden

Ruark Succeeds Duffield

B. W. Ruark, field secretary of the Automotive Equipment Association, has been appointed assistant to the commissioner, succeeding J. E. Duffield, resigned. Mr. Ruark started with the association in 1922 as a field secretary and was promoted to assistant to the commissioner early in 1925. From March, 1926, to April, 1927, Mr. Ruark was affiliated with the radio interests at their Chicago headquarters, returning to the A.E.A. in May as field secretary. Prior to 1922 he was connected with leading jobbers and manufacturers in the automotive industry for more than nine years.

Sneathen on Truck Committee

Howard E. Sneathen, director of commercial car and truck sales of Dodge Brothers, Inc., has been elected a member of the motor truck committee of the National Automobile Chamber of Commerce. Expansion of the committee was started this summer with the addition of R. G. Hayssen, president of Sterling Motor Truck Co., and W. C. Parker, manager of commercial vehicle sales of Reo Motor Car Co., as members.

Poole Takes Falcoln Zone

F. C. Poole, formerly assistant manager of the Ford assembly plant at Cincinnati, has been named by Falcon Motors Corp., manager of the Cleveland zone, which comprises Ohio, West Virginia and western Pennsylvania.

Means to Aid Haresnape

Arthur H. Means has been appointed assistant secretary of the contest board of the American Automobile Association. Mr. Means is widely known as a racing enthusiast and official, serving as secretary of the contest board for four years up to 1923 when he left to enter the accessory business. The appointment will give Val Haresnape, secretary of the board, more time for field work and for the development of additional races of championship character.

Hill on Conference Board

Arthur M. Hill, Charleston, W. Va., chairman of the bus board of the American Automobile Association, was made a member of the Motor Vehicle Conference Committee last week in Cleveland. It was also arranged to have bus operators on the city committees of the Motor Vehicle Conference Committee.

Korshin Joins Duckworth

M. R. Korshin has been appointed a special representative of the Duckworth Chain & Mfg. Co., Springfield, Mass., makers of Duckworth shock absorbing silent timing chains. In his new work he will maintain a close personal contact with the company and its jobbers.

Marx Joins Studebaker

Announcement has been made of the appointment of Rene Marx, for several years Locomobile distributor in Southern California, as manager of the custom department of the Studebaker Corp. of America, with headquarters at South Bend.

Chevrolet Officials Vie in Turkey-Bean Contest

More than 27,000 persons who make up the Chevrolet retail selling organization are participating in the second annual Turkey-Bean contest which will be staged during November by Chevrolet Motor Co. Chevrolet plans to sell 71,451 cars during the contest, R. H. Grant said in an interview.

Two major divisions of the country have been made with assistant general sales managers of the company in charge of each. D. E. Ralston has the western half and M. D. Douglas the eastern half. Each of these sections has been further sub-divided with the Flint region vs. Middle West region and the Great Lakes region vs. Pacific Coast. All of the 43 zone sales offices have also been pitted against each other.

Chevrolet sales officials have gone into the field to aid various groups. R. H. Grant, vice-president in charge of sales, is in the Great Lakes region for a week and will then move to other regions. H. J. Klingler, general sales manager, is on the Pacific Coast. Mr. Ralston is working in the Middle West; Mr. Douglas in the Southeast, R. K. White, sales promotion manager, has the Atlantic Coast and Sidney Corbett, manager of the truck division, is in the Flint region.

Durant Officials Promoted

H. J. Shorter has been appointed assistant sales manager of the Durant Motor Co. of New Jersey, and A. K. Steigerwalt has been named general manager of the parts and service division of Durant Motors, Inc., both with headquarters at the Elizabeth plant. Both men previously had been connected with the Durant organization.

Bremmer With World Bestos

H. R. Bremmer, who has been connected with the industry for 10 years, has become associated with the World Bestos Corp., Paterson, N. J., as manager of the New York district.

Fabian Oilgear Sales Head

G. H. Fabian has been appointed sales manager of the Oilgear Co., Milwaukee, and is undertaking a campaign to bring the product to a leading position in the industry.

Rose Named Sales Manager

M. Rose has been appointed sales manager of the Superior Running Board Mfg. Co., New York City, according to a company announcement.

Dudley New York Manager

Lynn B. Dudley, formerly advertising manager of Federal Motor Truck Co., has been appointed manager of the New York office of Campbell-Ewald Co.

Council to Promote Service is Approved

Representatives of Leading Automotive Associations Endorse Coordination Move

NEW YORK, Oct. 13—Steps for the formation of an Automotive Service Council to function in service matters as the Motor Vehicle Conference Committee does in legislative matters, were taken at a meeting of representatives of the leading automotive associations held this week in the offices of the National Automobile Chamber of Commerce. The principle of the council was approved and arrangements were made for preparation of a program to be presented to the boards of directors of the associations interested.

Present at the meeting were Coker F. Clarkson, representing the Society of Automotive Engineers; Alfred Reeves, National Automobile Chamber of Commerce; E. P. Chalfant, National Standard Parts Association; R. W. Ruark, Automotive Equipment Association; Percy Chamberlain, Greater Market Development of the Automotive Equipment Association; Neal Adair, Motor & Accessory Manufacturers' Association, and E. T. Clark, American Automobile Association. C. A. Vane, National Automobile Dealers' Association, and Earl Turner, of the Automotive Electric Association, were unable to attend, but wired their approval of the plan.

The form of organization of the Automotive Service Council was not definitely determined but it will consist of representatives of the associations interested, with a chairman to be selected by them.

Work is now being done on a program of activity. A large number of possible avenues of service are seen but a few of the more important will probably be selected for immediate attention. Among these are promotion of a uniform course of training for mechanics; cooperation in promotion of shop equipment exhibits; promotion of flat rate and coordination by a program of service meetings.

Style Changes Necessary to Meet Car Longevity

DETROIT, Oct. 11—It is now agreed among executives that there is a definite saturation point in this country for automobiles, said J. H. Hunt, president of the Society of Automotive Engineers, at the first session of the season of the Detroit Section. This point, he said, is variously set at between 30,000,000 and 35,000,000 registered cars.

Mr. Hunt emphasized that the increasing length of life of cars was a dangerous factor in approaching saturation. In order to offset this it will be necessary to so improve the appearance of automobiles frequently as to obsolete those in hands of owners. From this point of view alone, appearance is now a much more important factor relatively than mechanical design and construction. General mechanical designs are pretty well crystallized at present, and future changes which can be sold to the public will develop slowly and will not be as marked as in the past, he said.

The first meeting of the season of the Detroit Section was attended by 250 members, and was preceded by a dinner. Following the dinner Prof. S. N. Gale of the University of Michigan gave a talk on the automobile situation in China.

7 Companies Enter Guggenheim Tests

NEW YORK, Oct. 10—Five British and two American aircraft manufacturers have filed applications to enter the competition for $150,000 in prizes offered by the Daniel Guggenheim Fund for the Promotion of Aeronautics. The American entrants are the Schroeder-Wentworth Co., Chicago, and the Hall Aluminum Aircraft Corp., Buffalo, N. Y. Anthony H. G. Fokker has signified his intention of filing an application later as have several other American manufacturers.

British entries include DeHavilland Aircraft Co., Handley Page, Ltd., Vickers, Ltd., Glostershire Aircraft Co. and the company which is conducting tests with de la Cierva's Autogiro.

The competition will close Oct. 31, 1928, or any time prior to that date when the trustees of the fund may consider that the object of the competition has been achieved. Tests will be carried on from time to time at Mitchel Field, L. I., where Major Howard Davidson of the United States Army Air Service has been appointed field manager.

Hudson Officials Address Kansas City Oil Meeting

DETROIT, Oct. 8—Speaking before the Big Four state convention of oil men at Kansas City, W. A. James, advertising manager, and J. E. McLarty, service manager, of Hudson Motor Car Co., declared developments are on the way to motor fuels which will use much higher percentages of crude oil. Today about 30 per cent of the crude reaches the motorist's gasoline tank in the form of gasoline, they said and asserted that this ratio must go higher, and, to bring a higher ratio, told their hearers that engineers must design engines to fit fuels, and not demand special fuels to fit their designs.

Chevrolet Offers New Colors

DETROIT, Oct. 11—Chevrolet dealers are now showing the Imperial landau and cabriolet in new color schemes. The landau is now available in Bloomfield gray lower and black upper structure, with tan striping and wheels. Cabriolets are finished in jet black with tan top and striping.

Financial Notes

Mullins Body Corp. profit in September was $73,959 after charges but before Federal taxes, comparing with $75,974 in August. For first nine months of this year profit totaled $523,712 before Federal taxes, comparing with $235,200 in same period of 1926. Cash on hand Oct. 1 amounted to approximately $682,000.

C. G. Spring & Bumper Co. earnings for the fiscal year ended Aug. 31, after all charges including taxes, were at a rate of $1.62 per share on the outstanding common stock. This is more than twice the dividend requirements at the present rate of 80 cents per annum.

McCord Radiator & Mfg. Co. reports for the seven months ended July 31, 1927, profit of $398,225 after depreciation and other charges but before Federal taxes. The balance sheet as of July 31 shows current assets of $2,202,686 against current liabilities of $1,018,346.

Moon Motor Car Co. stockholders' meeting to vote on increase in authorized capital stock to 400,000 shares from 180,000 has been postponed until October 22.

General Motors Corp. common and preferred stockholders for the third quarter of 1927 totaled 57,190 compared with 57,595 in the preceding quarter.

Doehler Die Casting Co. reports for eight months ended Aug. 31, 1927, profit of $311,732 after charges but before Federal taxes.

Velie Models for 1928 Show Body Refinements

MOLINE, Oct. 12—Changes in the Velie line for 1928 consist mainly of refinements in the bodies making for improved appearance and convenience. All sedan models now have narrow all-metal front body pillar posts, new type tufted upholstery with form fitting cushions and seats, and remote control inside door handles with combination door lock and lever in door centers. New color combinations are offered. There has been no change in prices and mechanical specifications remain as in the late 1927 cars.

N.A.C.C. Votes Traffic Study

NEW YORK, Oct. 12—Directors of the National Automobile Chamber of Commerce have been requested by a vote of the members to bring in a platform making for traffic relief and a program to make it effective. This action was taken at the fall meeting at the suggestion of John J. Raskob.

Reo Reports 4000 Orders

LANSING, Oct. 11—Reo Motor Car Co. reports 4000 unfilled orders on hand. Production for September totaled 4318 units and it is expected that this figure will be reached again in October.

Steel Competition Brings Concessions

Ragged Condition in Sheet Market Noted—Conversion Meets Ford Needs

NEW YORK, Oct. 13—Automotive buying of steel products has neither broadened nor shrunk in the last few days. The fact that price is the uppermost topic in both the sheet and strip-steel markets indicates that a routine volume of business is being placed constantly, but that competition for every ton of it has grown much keener among mills.

A relatively small tonnage of full-finished automobile sheets recently reported to have been sold in the Detroit market at $2 per ton below the going price of 4.25 cents, Pittsburgh, started a more or less ragged condition in the sheet market as a whole. There are still some rollers who insist that 4.25 cents is their price for quality sheets, but undoubtedly quite a few sales have been made at $2 a ton below that price level.

The black sheet market shows the effect of this softening in full-finished sheets, and here, too, sales at 2.90 cents are being made by some while others declare that they are adhering to 3 cents, Pittsburgh.

So far at least, the sheet requirements for the new Ford model seem to be met by conversion orders. No one in the trade knows what the extent of the Ford holdings of semi-finished steel is, but certain it is that there is no very spirited competition among rollers for this conversion business.

A fair amount of automotive orders for cold-rolled strip steel is reported, and the market has a slightly steadier tinge. The same may be said of cold-finished steel bars. A decided improvement is noted in the demand for the higher grades of automotive alloy steels.

Pig Iron—Quite a few automotive foundries have ordered forward shipments of iron which they bought several months ago, but on which they had previously asked postponement of shipment. Blast furnace interests quote $18, furnace, in the Detroit territory on foundry and malleable, but slight concessions are the rule.

Aluminum—While July imports exceeded 10,000,000 lb., those of August fell below 3,000,000, being the lowest on record for any month of the current year and lower than the imports in any month of 1926. Bonded warehouse stocks on Aug. 1, reflecting the heavy imports of July, were the largest on record, exceeding 10,000,000 lb., but this tonnage is thought to have been materially reduced since then. The market is quiet, prices holding at unchanged levels.

Copper—There is still much room for improvement in consuming demand but producers are not pressing metal for sale and holding their quotation at 13¼ cents, delivered Connecticut, or 13⅜ cents, delivered Michigan.

Tin—In spite of the relatively low prices which prevail consumers continue to be offish.

Lead—Statistical computations, based on the slower pace of automotive production, indicate that storage battery manufacturers needed 2000 tons less lead last month than they did in September, 1926, and that their 1927 consumption so far is 10,000 tons behind that of last year. The market is steady.

Zinc—Demand is fair and many encouraging inquiries are in the market.

Bosch Offers Time Trial With New Shock Absorber

SPRINGFIELD, MASS., Oct. 12—American Bosch Magneto Corp. has brought out a new friction type shock absorber, designated the Type Y, which is designed for short wheelbase cars and is priced at $22 per set of four. The shock absorbers are packed in pairs with fitters attached, and with a new factory-set tension principle may be easily installed.

In marketing the new product American Bosch is including with each purchase a Purchaser's Trial Certificate which permits the buyer an unconditional 90-day trial with the privilege of having them removed at any time within that period and the purchase price refunded. The dealer is protected in this plan by being reimbursed by the factory on the return of the removed shock absorbers with the purchaser's certificate.

La France and Foamite Complete Merger Plan

ELMIRA, N. Y., Oct. 12—Proposals for the purchase by American La France Fire Engine Co. of the Foamite-Childs Corp., Utica, N. Y., both manufacturers of fire fighting apparatus, are to be voted on by stockholders of the two companies within two weeks. The name of the proposed corporation would be the American La France & Foamite Corp. Officers would be C. B. Rose, president of La France, president; W. J. Childs, president of Foamite, executive vice-president; F. M. Watters, vice-president and general manager of Foamite, vice-president.

Outlines Linn Sales Plan

ALMA, MICH., Oct. 12—Distribution of the Linn tractor line, recently acquired by the Republic Motor Truck Co., will be through the regular Republic dealer organization, except for New York State, where the Linn company developed an extensive selling group which will continue to function. The Linn company will continue manufacturing operations at Morris, N. Y., as a division of Republic and the present personnel will continue, according to O. W. Hayes, president of Republic.

Willys Offers Color Options

TOLEDO, Oct. 12—Willys-Overland, Inc., is offering five optional color combinations on the Willys-Knight 66-A line and two on the Willys-Knight 70 sedan without extra cost.

S.A.E. Visitors See Army Air Stunts

Direct Hit By Anti-Aircraft Gun Features Exhibition of New Equipment

PHILADELPHIA, Oct. 8—Nearly 4000 persons, numbering among them many members of the Metropolitan, Pennsylvania and Washington sections of the Society of Automotive Engineers, attended the ninth annual meeting of the Army Ordnance Association held at the Aberdeen Proving Ground this week.

Demonstrations of the latest types of equipment designed by army and civilian organizations for defensive and offensive warfare followed one another in quick succession. Possibly the most spectacular event of the day was the night firing at a target towed by an airplane, tracer ammunition being used so that the spectators could follow the course of the shells. A fitting climax to the day's program occurred when the last round fired by a recently developed, 3-in., anti-aircraft gun at a target about 5 x 20 ft., being towed by an airplane at an altitude of 1½ miles and about 2½ miles slant range from the gun, made a direct hit.

Of particular interest to automotive men was a demonstration of recently developed tanks, tractors and trucks designed for hauling heavy loads over rough terrain. Among the trucks were two six-wheel drive trucks designed by the Quartermaster Corps, a Coleman four-wheel drive truck, a Six Wheel truck, a Versare eight-wheel gas-electric and some light trucks designed by the Quartermaster Corps.

S. A. E. Visits Boston Airport

BOSTON, Oct. 10—The New England Section of the Society of Automotive Engineers at its monthly meeting visited the airport at East Boston where they inspected various planes. In the evening there was a dinner, after which Lieutenant Walter F. Earle, of the aeronautical research department, of Massachusetts Institute of Technology, talked.

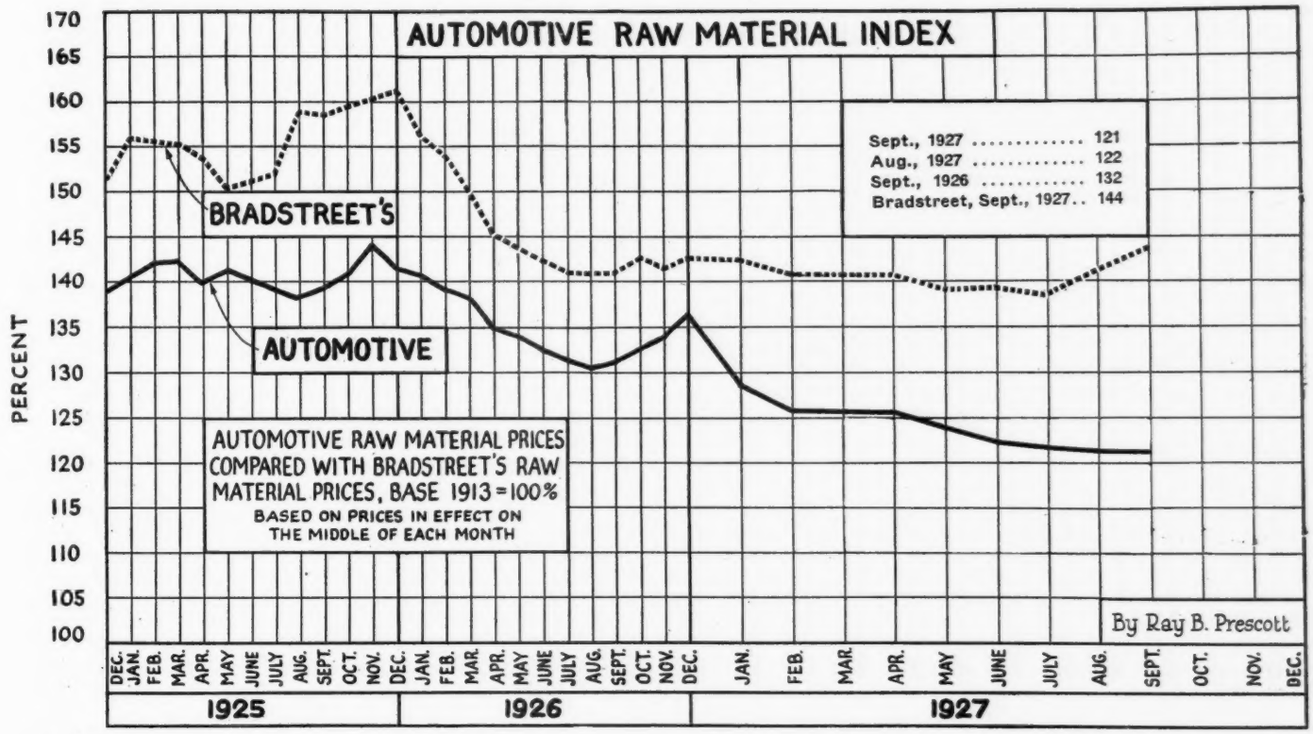
Plan New S. A. E. Section

SPOKANE, Oct. 8—Decision to organize a Washington section of the Society of Automotive Engineers was reached by members from the state attending the recent aeronautic sectional meeting here. The meeting was a national session and the Washington group are planning to reconvene in a few days in Seattle to perfect the organization of the chapter.

Velie Adds Sales Outlets

MOLINE, Oct. 12—Velie Motors Corp. has added three distributors and 20 dealers, according to a factory release, the distributor appointments being in Seattle and Yakima, Wash., and Cowen, W. Va.

Raw Material Index Falls One Point



22 Manufacturers Added by N.S.P.A.

DETROIT, Oct. 10—The largest addition to the membership of the National Standard Parts Association ever made at one time was ratified by the membership and executive committees meeting in Detroit this week, when 22 manufacturers and 17 jobbers were accepted. This brings the membership of the association to 279. New manufacturer members are: B. C. Ames Co., Waltham, Mass.; Armstrong-Cork Co., Pittsburgh; Bunting Brass & Bronze Co., Toledo; H. A. Douglas Mfg. Co., Bronson, Mich.; Echlin & Echlin, Inc., San Francisco; Heiz & Heiz, Brooklyn; National Machine & Tool Co., Jackson, Mich.; William E. Pratt Mfg. Co., Chicago; Ramsey Chain Co., Inc., Albany, N. Y.; Arrow Head Steel Products Co., Minneapolis; Automotive Maintenance Machinery Co., Chicago; Diamond Motor Parts Co., St. Cloud, Minn.; Duckworth Chain & Mfg. Co., Springfield, Mass.; Fleming Machine Co., Worcester, Mass.; Johns-Manville Corp.; New York; Pep Mfg. Co., New York; Protex Chain Co., Inc., Waynesboro, Pa.; Schlieder Mfg. Co., Milford, Mich.; Sterling Products Corp., St. Louis; J. H. Williams & Co., Buffalo; Thermoid Rubber Co., Trenton, N. J., and the Willis-Jones Machinery Co., Inc., Seattle.

Falcon Service Cost Low

DETROIT, Oct. 10—Falcon Motors Corp. has completed a survey of dealers' service costs to cover the first six months of operation of its dealer organization. The survey comprised the combined reports of 750 dealers and, according to John A. Nichols, Jr., president, shows that service expense has been lower than on any car they have handled previously.

Robertson Aircraft Gets Right to Curtiss Name

ST. LOUIS, Oct. 12—Curtiss-Robertson Aircraft Corp. has been organized here with a capital of $250,000 to manufacture airplanes. Negotiations have been completed with the Curtiss Aeroplane & Motor Co., Inc., whereby it will be authorized to manufacture commercial planes bearing the Curtiss name. Associated with Major W. B. Robertson in the new company are H. H. Bixby, H. H. Knight, Arnold Stifel and J. D. Livingston.

Long Breaks Ground

DETROIT, Oct. 8—Long Mfg. Co. manufacturer of automobile radiators and clutches, has broken ground for the first unit of its new factory here. The new factory will house the clutch division and power house. The plant and equipment are scheduled to be in operation in three months.

Moto Meter Unit Nearly Ready

NEW YORK, Oct. 10—The Moto Meter Co., Inc., will complete next month building additions to the plant of its subsidiary, National Gauge & Equipment Co. of La Crosse, Wis., which will increase its floor space about 40 per cent. About one-half will be added to the industrial gage division.

Timken Makes Plans for European Plants

CANTON, OHIO, Oct. 10—Acquirement of complete control of the manufacture and distribution of Timken roller bearings throughout the world, was accomplished recently by Timken Roller Bearing Co. in the purchase of the British-Timken interests, Birmingham, England, by the company and M. B. U. Dewar, London, England.

The active management of British Timken affairs now will be under Mr. Dewar, who, until recently, was managing director of the Metropolitan Carriage, Wagon & Finance Co., Ltd., Birmingham, and also a member of the industrial management board of Vickers, Ltd.

The Birmingham plant of the company is being enlarged and new machinery and equipment installed.

Officials of the British Timken, who were in this city Friday, are M. B. U. Dewar and W. E. Hobley. At the meeting here it is said that final arrangements were discussed for the immediate establishment of factories in France and Germany.

Grey-Rock Patent Granted

MANHEIM, PA., Oct. 12—United States Asbestos Co. has been granted a patent giving full protection to the special "smooth ground braking surface" of Grey-Rock. This surface is obtained by a special process which makes possible a closer first adjustment and consequently more perfect seating and smoother, quicker stopping power.

Detroit Railway Buses Speed Trolley Service

DETROIT, Oct. 10—A combination local and express service, with buses taking the local and electric cars the express traffic, was inaugurated Sept. 18 by the Detroit Street Railways. As operated at present, in order to expedite traffic on Jefferson Ave., bringing passengers from outlying districts into the center of town, the trolleys are for a distance of 4.15 miles operated on an express schedule with stops ranging from 7 to 15 blocks. Paralleling the street railway lines are single-deck 21-passenger Graham Brothers buses which pick up passengers at the far corners of all streets and deposit them, if desired, at the trolley safety zones where express stops are made.

Not only has this system enabled a decrease in transit time of from 20½ to 13½ minutes in the express zone, representing an increase in average speed of from 12.1 to 18.4 m.p.h., but a very marked increase in vehicular traffic speed has resulted from the elimination of local street car stops.

A. E. A. Invites Industry

CHICAGO, Oct. 10—A special invitation to the automotive trade for a private viewing of the ninth annual exposition of automotive products at the Coliseum, on the evenings of Nov. 8 and 9, has been issued by the Automotive Equipment Association. This invitation is a departure from precedent, as the annual exposition of advance models of automotive equipment, accessories, parts and supplies has hitherto been limited to members of the association.

Coming Feature Issues of Chilton Class Journal Publications

Nov. 10—Marketing Annual—Motor World Wholesale

Feb. 18—Statistical Issue—Automotive Industries

Jan. 1—National Shows Number—Automobile Trade Journal.

Jan. 5—National Shows Issue—Motor Age.

Fifteen Cars Scheduled for Exhibition at Salon

NEW YORK, Oct. 12—Cars to be exhibited at the annual automobile salon in the Commodore Hotel, Nov. 27 to Dec. 3, are Cadillac, Chrysler 80, Cunningham, Franklin, Isotta Fraschini, La Salle, Lincoln, Mercedes, Minerva, Packard, Pierce-Arrow, Renault, Rolls-Royce, Stearns-Knight and Stutz. Special custom coachwork will be exhibited by Brewster, Brunn, Derham, Dietrich, Fisher, Fleetwood, Holbrook, Judkins, Le Baron, Locke, Rollston, Sala, Weymann and Willoughby. Some of the foreign bodies mounted on European cars are by Kellner, Hibbard & Darrin, Million-Guiet, Binder and Castagna.

The salon will be repeated after the first of the year at the Drake in Chicago, the Biltmore in Los Angeles, and the Palace in San Francisco.

Unprotected Crossings Scene of Most Accidents

NEW YORK, Oct. 10—The street traffic committee of the National Automobile Chamber of Commerce has just concluded a survey of commercial vehicle accidents in Hartford, Conn., between Jan. 1 and June 30, 1927, of which detailed report may be obtained from the chamber.

The survey, which is believed to be the first of its kind ever attempted, with a careful analysis of the causes of accident, expected to be the basis of further study and for definite action looking to the removal of causes of accidents.

For instance, it was found that two-thirds of the right-of-way accidents occurred in the congested sections of the city and that of the 36 intersections in which all of the accidents occurred, 29 were unprotected.

The N. A. C. C. reports motor fatalities in cities of more than 100,000 population as 499 in August, 1927, compared with 442 in July and 488 in August, 1926.

19 Trucks to be Shown

NEW YORK, Oct. 12—Trucks to be exhibited at the national automobile shows are American-La France, Chevrolet, Corbitt, Cunningham, Federal, G. M. C., Graham, Larrabee-Deyo, Reo, Roamer, Sayers & Scoville, Schacht, Selden, Star, Stewart, Studebaker, Stutz, Ward and Yellow. Yellow taxicabs also will be shown. All of the passenger car makers selling nationally will exhibit.

Calendar of Coming Events

SHOWS

All Western Road Show, Los Angeles ..... March 7-11
American Road Builders Association, Public Auditorium, Cleveland..Jan. 9-13
Argentine .....Nov. 10-20
Automotive Accessories Association, Armory, Chicago .....Nov. 7-12
Automotive Equipment Association, Coliseum, Chicago .....Nov. 7-12
Berlin, Exhibition of Engineering Materials .....Oct. 22-Nov. 13
*Boston, Mechanics Bldg.....March 10-17
*Chicago, National Automobile Chamber of Commerce, Coliseum ..... Jan. 28-Feb. 4
Electrical and Industrial Show, Grand Central Palace, New York....Oct. 12-22
Glasgow .....Nov. 4-12
International Aircraft Show, Berlin ..... March 23-April 11
Lille, France, Exposition..Nov. 20-Dec. 4
London Passenger Car Show ....Oct. 14-22
London Truck Show .....Nov. 17-26
Montevidio .....Nov. 19-27
National Standard Parts Association, Convention Hall, Cleveland..Nov. 14-18
*New York, National Automobile Chamber of Commerce, Grand Central Palace .....Jan. 7-14
Rio de Janeiro .....May 3-13
Sao Paulo .....Oct. 15-30
Salon, Automobile Salon, Inc., Hotel Drake, Chicago .....Jan. 28-Feb. 4
Salon, Automobile Salon, Inc., Hotel Biltmore, Los Angeles .....Feb. 11-18
Salon, Automobile Salon, Inc., Hotel Commodore, New York..Nov. 27-Dec. 3

*Will have special shop equipment exhibit.

Salon, Automobile Salon, Inc., Palace Hotel, San Francisco..Feb. 25-March 3
United States Good Roads Show, Des Moines .....May 28-June 1

CONVENTIONS

American Gear Manufacturers Association, Mt. Royal Hotel, Montreal ..... Oct. 20-22
American Management Association, Palmer House, Chicago .....Nov. 1-4
American Road Builders' Assn., Hotel Hollenden, Cleveland .....Jan. 9-13
American Road Builders' Association, Banquet, Hollenden Hotel, Cleveland .....Jan. 11
Associated Manufacturers of Fabric Auto Equipment, La Salle Hotel, Chicago .....Nov. 5
Automotive Equipment Association, Coliseum, Chicago .....Nov. 7-12
Berlin, Conference on Engineering Materials .....Oct. 22-Nov. 13
National Association of Finance Companies, Congress Hotel, Chicago ..... Nov. 14-15
National Foreign Trade Council, Houston, Texas .....April 25-27
National Hardware Association, Marlborough-Blenheim, Atlantic City ..... Oct. 17-20
National Research Council, Washington, D. C. .....Dec. 1-2
National Standard Parts Association, Hotel Hollenden, Cleveland..Nov. 14-18
National Tire Dealers' Association, Brown Hotel, Louisville, Ky..Nov. 15-17
Overseas Automotive Club, Inc., Overseas Visitors' Dinner, Stevens Hotel, Chicago .....Nov. 9
Overseas Automotive Club, Inc., Monthly Luncheon, Hotel Astor, New York .....Dec. 8
United States Good Roads Association and Bankhead National Highway Association, Des Moines..May 28-June 1
World Motor Transport Congress, London .....Nov. 14-17

N. A. D. A.

Chicago, Jan. 31-Feb. 2—Annual, Palmer House.
Chicago, Feb. 1—Banquet, Palmer House.
New York, Jan. 9-10—Eastern District, Hotel Commodore.

S. A. E.

National

Chicago, October 25-27—National Transportation and Service Meeting.
Chicago, Dec. 1—Tractor Meeting.
Detroit, Jan. 24-27—Annual Meeting.
European trip—Nov. 2-Dec. 12.
New York Sessions, October 18-20—Aeronautic Meeting.
New York, Jan. 12—Annual Dinner.

Sectional

Cleveland, Oct. 17—Notes on Valve Spring Design—W. T. Donkin. Slow motion pictures of valve springs in action.
Metropolitan, Oct. 20—Airports and Their Relation to Commercial Aviation—Gen. J. F. O'Ryan. A Commercial Airport for New York—Hon. Wm. P. McCracken, Jr. Need for Design and Construction of Airports—Wm. E. Arthur.